ROLE OF DIAGNOSTIC HYSTEROLAPAROSCOPY IN EVALUATION OF PRIMARY INFERTILITY

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CERTIFICATE

This is to certify that the Dissertation entitled **"ROLE OF DIAGNOSTIC HYSTEROLAPAROSCOPY IN EVALUATION OF PRIMARY INFERTILITY"** is the bonafide original work of DR.D.VANI under the guidance of **Prof. Dr. P.Meenalochani MD., DGO.,** Associate Prof. of Department of Obstetrics and Gynecology KMCH, Chennai in partial fulfilment of the requirements for MD (Obs and Gyne) branch II examination of the Tamil Nadu Dr. M.G.R Medical University to be held in March 2010. The period of postgraduate study and training was from May 2007 to March 2010.

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LIST OF ABBREVIATIONS

1. DHL	-	DIAGNOSTIC HYSTEROLAPAROSCOPY.
2. HSG	-	HYSTEROSALPHINGOGRAM.
3. USG	-	ULTRASONOGRAM
4. SHT	-	SELECTIVE HYDROTUBATION
5. PID	-	PELVIC INFLAMMATORY DISEASE
6. TB	-	TUBERCULOSIS
7. MTP	-	MEDICAL TERMINATION OF PREGNANCY
8. OPD	-	OUT PATIENTS DEPARTMENT

TABLE OF CONTENTS

S.NO.	TITLE	PAGE NO.
1	***Introduction***	*1*
2	***Aim of the study***	*2*
3	***Review of literature***	*3*
4	***Materials and methods***	*41*
5	***Observation, discussion and Analysis***	*42*
6	***Summary and conclusion***	*68*
7	***Bibliography***	
8	***Annexures*** ❖ ***Proforma*** ❖ ***Master chart*** ❖ ***Key for Master chart***	

INTRODUCTION

INTRODUCTION

Infertility is defined as childlessness after 1year of unprotected intercourse. This is also known as sub fertility. It affects 10-15% of couples in the reproductive age group.

Infertility represents a life crisis to the couple experiencing it. It may severely affect the couple's psychological harmony, sexual life and has many social implications . Hence every gynaecologist hesitates to confirm infertility until he or she has thoroughly exhausted all diagnostic and therapeutic modalities.

According to **Lindemann[1] et al** (1979) Laparoscopy And Hysteroscopy can be combined in one session to permit a full survey of the uterus and tubes and is useful in detecting the cause of infertility in female. This also minimises the hospital stay of the infertile woman for investigations.

In this study the possible causes of primary infertility have been evaluated by Hysterolaparoscopy. With little more practice & perseverance the outlook for infertile woman will be improved greatly by newer & newer technologies.

AIM OF THE STUDY

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To diagnose the etiological factors of Primary infertility in the infertile couple attending the infertility clinic, OBG Department, KMCH using diagnostic Hysterolaparoscopy and to analyse those etiological factors.

REVIEW OF LITERATURE

REVIEW OF LITERATURE- HYSTEROLAPAROSCOPY

Hysteroscopy is an Endoscopic procedure utilizing a telescope and a method used to distend the uterine cavity for systemic inspection of the interior of the uterine cavity. The Hysteroscope has evolved over the last 2 centuries through a long and ardous struggle.

History of Endoscope

The history of Endoscopy begins as early as the 9th century. In 1805 **Bozzini**[2] (1773-1809) constructed a device called a light conductor that enabled him to inspect various passages and body cavities. This instrument consisted of a square windowed tube. Candlelight was directed by a concave mirror through a narrow tube into the cavity. The results were not satisfactory. **Bozzini** recommended this device for the detection of small tumors and changes in the uterine cavity, for the diagnosis of causes of female sterility and for internal examination when complications occurred during pregnancy.

The first Hysteroscopy was described in 1869 by **Pantaleom.** The patient was 60years old with resistant uterine bleeding .A straight tube 12mm in diameter, similar to the device **Desormeaux** used in 1865 to examine the urethra was inserted into the uterine cavity. Polypoid

endometrial growths were observed. **Pantaleom** used reflected candlelight from a concave mirror to illuminate the uterine cavity.

Endoscopy at present

The present era in endoscopy began with **Nitze**[3]**,** who demonstrated a Cystoscope to the Royal medical board of Saxony and in 1879 published an account of the instrument. **Nitze** inserted the illuminator & endoscope directly into the bladder. In collaboration with **Leiter**, a Viennese instrument maker, he added optical lenses. Both illumination and field of vision were increased.

To obtain a good view of the uterine cavity it is necessary to maintain an adequate distance between the endoscopic lens & the endometrium. Early practitioners of uteroscopy proceeded without initially distending the uterus. The instruments were straight tubes of varying lengths & diameters. The light came from candles, kerosene lamps or incandescent bulbs directed by a reflector to illuminate the area. This method did not produce satisfactory results. The tube could not be moved easily within the uterine cavity, and the value of hysteroscopy remained limited.

The **Nitze**[3] principle of endoscopy was not adopted for Hysteroscopy. In 1893 **Morris** used a straight silver & brass tube 9mm is diameter & 22mm long. An obturator inside the tube was withdrawn once the instrument had been introduced into the uterine cavity leaving the hollow

tube to serve as an endoscope. **Morris** observed the tubal ostia & the endometrium**. Bumm** , using a head lamp with a reflector and the cystoscope described endometrial changes, including granulation, ulcers and polyps. Bleeding & mucus frequently obstructed his vision. **Blondel** complained of similar difficulties & to alleviate these problems, a new type of Hysteroscopy was proposed by Beutner in 1898. It was equipped with a water sprinkler system simultaneously, **Duplay** and **Clada** experimented with a hysteroscope equipped with a mandarin and an illuminator located near the eyepiece. **David** constructed an endoscope modeled on Nitze's cystoscope with a built in lens to magnify the image. The illuminating system was mounted externally, near the viewing end of the instrument. When the device was inserted into the uterine cavity, the physician was able to look directly towards the uterine fundus. **David** demonstrated that Hysteroscopy was useful for diagnosis of uterine disorders.

Heineberg[4] developed a water Sprinkler system to rinse off the blood that often covered the lens and hindered vision. **Rubin** insufflated the uterine cavity with CO_2 instead of water. The procedure was similar to tubal pertubation. The Hysteroscope was a modified **Mc Arthy** Cystourethroscope. The pointed end was rounded off to avoid trauma.

Seymour introduced a Hysteroscope fitted with a suction tube that could drain mucus and blood from the uterine cavity. In 1927, **von mikulicz – Radecki** and **Freund** collaborated to produce a "Curettoscope" with a rinsing system to wash, angled towards the side with an optical magnification of 1:4. The instrument afforded a good view of the cavity & enabled the physician to perform directed endometrial biopsies [5] .

In 1982, **Gauss** reported experiments with a similar instrument. Anasthesia was used only in Nulliparous women.

Schroeder succeeded in developing an instrument with an excellent forward viewing optical system, a significant advantage over earlier designs with side mounted apertures. It thus became possible to inspect larger areas of the cavity and to achieve 3 dimensional views. The instrument had an external diameter of 10mm. Examinations on multiparous woman were done without need for anasthesia. A few drops of epinephrine solutions were often added to the rinsing fluid to reduce the tendency of the endometrium to bleed.

Encouraged by the work of **Dickinson** and of **von Mikulicz Redecki, Schroeder** also attempted transuterine tubal sterilization. Other pioneers of Hysteroscopy during these years were **Bank, Schack** and **Segond [5].**

Palmer proposed a Hysteroscope with a diameter of 5mm to eliminate the need to dilate the cervical canal. To distend the uterine cavity, he advised using the standard water irrigation system. [4]

Marleschki made a special study of the blood circulation of the endometrium with an instrument 5mm in diameter and x12.5 magnification placed in direct contact with the endometrium. [5]

A new era in hysteroscopy began with the introduction of viscous fluids as media for distending the uterine cavity. **Menken**[5] reported on his experiments with Luviscol, a Polyvinyl pyrollidone with a molecular weight of 200,000. Media currently in use include Dextran 70 (Hyskon, Edstrom and Ferntorm), Co_2 gas (Lindemann & porto and Gaerjoux) and a 5% glucose solution (Quiones and colleagues).

Improvements in instruments, light sources and ancillary apparatus have facilitated the development of Hysteroscopy. Ultimately, a successful examination of the uterine cavity depends on the physician's skill. The endometrium remains highly sensitive and blood and secretions can hinder vision during Hysteroscopy. As far as the future role of Hysteroscopy is concerned, a vigilant eye in the uterine cavity is better than numerous blind curettings.

Table - 1

Historical milestones in Hysteroscopy

Author	Year	Contribution
Bozzini	1807	First endoscope. First scientist to conduct light into human body.
Pantaleom	14.7.1869	First hysteroscopic examination, visualized a polyp responsible for Menorrhagia & cauterized it with silver nitrate .
Nitze	1879	Cystoscope with distal illumination.
Heineberg	1914	Internal light source, Water rinsing system .
Rubin	1925	Used a Cystourethroscope, insufflation with $Co_{2.}$
Seymour von mickulicz	1926	Suction tube to remove blood.
Redeki and Freund	1927	Dual circuit water rinsing system .
Vulmiera gladra	1952	Cold light fibre optic.
Maleschki	1965	Earliest Contact Hysteroscopy.
Portod and Gaujox	1971	Pneumohysteroscopy, Insufflation with $Co_{2.}$
Vulmiere	1972	Contact Hysteroscope
Homour	1980	Contact microcolpohysteroscopy.

Current Concepts in Hysteroscopy

According to **Wilczak et al** the Hysteroscopic evaluations of structural changes located in uterine openings seem to be a reliable method for evaluation of patency of oviducts [7,13]. This procedure may help in choosing the proper way of therapy- Microsurgery or In vitro fertilization.

According to **Miyazaki[8] et al** Selective Hydrotubation (SHT) with flexible Hysterofibroscope is an effective method for evaluating tubal obstruction & for managing it in a selected group of patients with tubal obstruction. The success rate of SHT in unilateral obstruction were significantly higher than in bilateral obstruction[8].

Tremendous advances have been made in Operative Hysteroscopic procedures to treat septate uteri, such as those procedures advocated by **Jones and Jones** as well as **Strassman** (now are considered obsolete unless there is a broad Septum). New techniques for ablation of the endometrium as an alternative to Hysterectomy have been reported by **Baggish[8]** and **Baltoyannis, Goldrath, Fuller** and **Segal** and **Lomano**. Reports by **Neuwirth** and **Amin,** and **Decherney** and **Polan** document their techniques for hysteroscopic management of submucus myoma[10]. Other new techniques discussed in the recent literature include precise cutting of synechiae, reported by **Reed** and **Erb[11]**. Areas of development now undergoing

feasibility studies include cannulation of the tube for retrograde placement of Ovum (ie, reverse gamete intrafallopian tube transfer procedure for women with obstructed oviducts[9]), direct treatment of endometrial carcinoma by ablation or by photodynamic therapy before Hysterectomy and direct local injection of progesterone in cases of intractable bleeding secondary to submucus myomas.[15]

Review of Literature- Laparoscopy

Enormous technical advances have taken place since the idea of using reflecting light into the deeper body cavities for diagnostic purposes was first conceived & these have led to perfection of modern endoscopic techniques.

As early as 1805 **Bozzini**[16] in Germany visualized the urethral orifice with candle light and simple tube. **Desormeaux's**[17] in 1843 used the first Urethroscope and Cystoscope using mirrors to reflect light from kerosene lamp. **Kelling**[17] in 1902 did perineal endsocopy in dogs using a needle and Cystscopy designed by **Nitze.** **Jocobeus** in 1910 used trochar and cannula to induce pneumoperitoneum in women and introduced Laparoscopy. Although the first pneumo peritoneum was created using air, **Zollikeffer** from Switzerland went on to use Co_2. A fore oblique 45˚ lens system & the use of second puncture for abdominal procedures were introduced by **Kalk**[18] of Germany, father of internal Laparoscopy. **Palmer**[19]**,** in France was the

first Gynaecologist to use Laparoscopy on wide basis in 1947 (250 cases). **Palmer** used the lithotomy Trendlenberg position & created a gaseous distension. He is also credited with using a uterine cannula to elevate the uterus. **Frangenheim**[19] of Germany (1952) modified and designed numerous instruments for Laparoscopic surgery and also made the first prototype of the modern Co_2 insufflation apparatus.

In 1962, **Palmer**[5] published his initial experience with destruction by unipolar electro sugery of isthmic & proximal ampulla of the tube. The search for safe and effective methods of sterilization led to bipolar electrocautery, thermocoagulation and use of rings and clips. **Semm**[17] of Germany in 1974 reported the performance of Salphingectomy, Myomectomy, Oopherectomy, Ovarian Cystectomy and Salphingostomy through the laparoscope. **Streptoe**[18] was the first to use the laparoscope for oocyte collection prior to In vitro fertilization. **Gome**[18] in 1977 did sharp dissection & Neosalphingostomy in 9 patients with previous tuboplasties. Four of the patients conceived subsequently.

According to **S.Gupta** (1989) who studied 300 cases by Laparoscopy, Laparoscopy has proved a great value in infertile patients because of

- low complication rate .
- it is conclusive and easy to interpret findings.
- Tubal, uterine & ovarian factors are investigated at one session itself.

-Functional tubal spasm eliminated in Laparoscopy.

-Unnecessary laparotomy which would have been undertaken after Hysterosalphingogram is avoided.

Current concepts in Laparsocopy

According to **Zuo-W[20, 36] et al** tubal insufflation has no longer its place in tubal patency assessment due to its gross inaccuracy. Both hydrotubation & HSG can be used as screening methods. Laparoscopy is the most accurate procedure in assessing tubal patency as well as in searching pelvic abnormalities.

According to **GU- Zhang- et al** laparoscopic examinations combined with transvaginal Sonogram are very useful approaches in the etiological study of female infertility. [37]

According to **Muzu L et al** bilateral tubal diverticula appear to be often misdiagnosed at Hysterosalphingogram as distal tube occlusions.

Newer Advances

Endoscopic Ultrasound[12]

Although Laparoscopy is an important tool for evaluating the pelvic pathology, visualization is limited to the surface of the structures. High resolution images can be obtained with Endoscopic Ultrasonogram that

allows us to evaluate and define pelvic pathology suspected at the time of Laparoscopy. Endoscopic ultrasonogram augments the diagnosis of subtle pathologic findings during Laparoscopy **(Hurst Bs et al).**

Microlaparoscopy[15,36]

New sub 2.0mm diameter microlaparoscope to be used for Diagnostic Laparoscopy delivered an image much more similar to that of conventional Laparoscopy & required little or no change in technique in order to obtain images [4]. There was less post procedural discomfort, minimal scar formation due to smaller access ports **(Baues u et al),** can be used for second look to know the result of tubal reconstruction, adhesions and endometriosis excision. Mutiple reports have followed, that attest to the successful use of laparoscopy for operative as well as diagnostic purposes.

Instrumentation in Hysteroscopy

There are 3 main types of Hysteroscopy [22]

1) Panoramic Hysteroscopy
2) Contact Hysteroscopy
3) Colpomicro Hysteroscopy

Panoramic Hysteroscopy [22,23]

Visualisation of entire uterine cavity after distending it is the basis of this method. The distending media used is either Co_2, dextran or crystalloids.

Contact Hysteroscopy[22,23]

Marleschki's universal Hysteroscope has an outer diameter of 4mm. This eliminates the necessity for cervical dilatation and anasthesia even in nulliparas. Uterine distension is unnecessary. There is no need of light source. Uterine bleeding does not interfere with the procedure. Interpretations of the finding requires experience. No panoramic view is possible because only surfaces in contact with tip of the Hysteroscope are visible.

Colpo Micro Hysteroscopy[23,24]

Incorporates a facility to magnify from x1 to x150 to allow examination of vascular and cellular structure of the endocervix & endometrium. When used at high magnification, the lens is in contact with the surface & complements colposcopy when the squamocolumnar junction is within the endocervical canal. Fine cellular detail can be observed after vital staining with Waterman's blue. An operating sheath which allows scissors, diathermy , probes & biopsy forceps to be introduced for intra uterine surgery under direct vision is optimal.

The Basic Equipment Includes

1. Viewing system
2. Distension media
3. Light Delivery systems
4. Ancillary instruments

Viewing system[23,24,25]

The Hysteroscope is an endoscopic instrument consisting of an optical & mechanical part to inspect the uterine cavity. The optics, built for a source of cold light consists of 2 parts, the system of lenses transmitting the image and the fibreglass conducting cold light. The best light source and clearest optics consistent with the smallest outside diameter are most attainable when the 4mm telescope is selected.

The optical system can be

1) Flexible Fibre optic Hysteroscope (or)
2) Rigid Hysteroscope

The completely new Hopkins rodlens optical system was designed and developed using special glass rods instead of small lens placed at certain intervals. Each optical system has its own direction of view and its own eye field. The direction of view varies between o˚ and 30˚. The largest field (i.e) 90˚ is obtained with Hopkins system. Telescopes are usually available as 0˚straight on view or 30˚ fore oblique view. A 30˚ fore oblique scope allows

a more rapid inspection of the uterine cavity & is preferred in diagnostic Hysteroscopy. The diameter of the Hysteroscope ranges between 2-8mm.

[28]The telescope can be divided into 3 parts

1. Eyepiece
2. Barrel
3. Objective lens

Surrounding the optics are numerous small diameter incoherent fibreoptic bundles that provide intense, cold light to the operative field. Currently a few manufacturers offer a choice of fixed focus or variable focus telescope. The variable focus technique exposes points <1mm from the objective lens to magnification and even allows light contact with the enodmetrium (contact hysteroscopy). The accrued benefit of the magnified or contact capability is the ability to study vascular & structural details of the tissues. The shaft is a circular stainless steel tube 30cm long through which the optic is pushed. Through this shaft the distending medium, gas or liquid is injected through a stopcock at the proximal end of the shaft. The hole must be airtight if Co_2 is used. The operating shaft has a supplementary channel (also air tight) with a stop cock & usually with an extra rubber cap, through which ancillary instruments are introduced.

Flexible Fibreoptic Hysteroscopy [26,27]

The flexible endoscope consists of conducting fibres for light and others for the image put together into one shaft. The quality of the image is rather granular for its weaker resolution. At the moment, the use of flexible endoscope in Hysteroscopy is controversial. The price and fragility of the instrument are deterrent to wider acceptance. A positive point is the possibility of penetrating into the tubal ostium with greater ease. **Mohri** and associates have built a tubaloscpe in the style of **Machida**.

Flexible Fibreoptic Hysteroscopy

Light delivery system [25,26]

The quality and power of light delivered to the telescope depend on the wattage and characteristics of the remote light generator as well as the type & structural integrity of the connecting fibreoptic light cable.

Three general types of light generators are available

1. Tungsten
2. Metal halide
3. Xenon

The simplest & cheapest generator is the tungsten generator, which produces orange yellow tinged light. The metal halide is a powerful generator that provides sufficient light for still & television photography but casts a bluish tinge to the field. The most intense illumination is given off by the Xenon light source. The xenon generator, which provides, clear white light provides the best shower for video imaging.

Fibreoptic light cables [27]

Adequate illumination is obtained for Panoramic Hysteroscopy using fibreoptic light cables which transport the light from the source (150w light source) to the scope. Fibreoptic light cables must be intact to convey the optimal light from the generator to the telescope. Broken fibres can be identified easily by viewing the stretched out cable against a dark background & looking for light emission through the sides of the cable.

Fluid Light cables[27]

The light transmits through a fluid medium but the cables are less flexible. Brighter images are obtained because they allow more light with better colour. This is more expensive.

Diagnostic and operative sheaths [26,27,28]

To perform Panoramic Hysteroscopy, a sheath is required to deliver the distending medium into the uterine cavity. Sheaths are either diagnostic or operative. The 5mm diagnostic sheath fitted with a single stop cock is all that is required for simple evaluation of uterine cavity. The 5mm instrument allows easy access through the narrow endocervical canal & past the point of maximal constriction, the internal os of cervix. This canal can be negotiated safely under direct vision without fear of perforation. The telescope must couple securely to the hysteroscopic sheath. When the coupling is imprecise, leakage of medium will occur at the interface.

Recently, a new type of operating sheath has been invented, according to **Baggish**[26]**.** This sheath is constructed with 2 separate operation channels - an isolated channel for the telescope, and a fourth channel for medium instillation. Isolated channels have the unique advantage of allowing the uterine cavity to be flushed off blood and other debris while maintaining the telescope in situ. The 2 operating channels permit an aspirating tube plus an instrument to be inserted into the uterine cavity simultaneously.

Although dilatation is usually required for insertion of the larger operating sheaths, occasionally they may negotiate the internal os without dilatation in multiparous women.

Accessory instruments[26]

-Grasping forceps

-Cup biopsy forceps

-Scissors

-Long flexible needle

Distension Media [24]

Hysteroscopy involves examination of endometrial cavity-a potent space & therefore requires distension for panoramic examination. Common agents used are gas and liquids.

Co_2 As distension Media [24,25,26]

The only gas used is Co2 delivered through hysteroflator with controlled delivery at flow rates of <100ml/hr & pressure not to exceed 200mm Hg. Co2 is colourless, nonpoisonous and non conducting. It is not flammable & does not support combustion. It has the same refractory index as air. At low flow rate, Co2 dissolves in blood at body temperature within one minute and there is no danger even if intravasation occurs.

Liquid distension media [24,25,26]

1) High Viscosity fluids (Dextran 70 or Hyskon)
2) Low viscosity fluids

(i) Electrolyte solutions

- ❖ Sodium chloride
- ❖ Lactated ringer solution

(ii) Non electrolyte solutions

- ❖ Glycine 1.5-2%
- ❖ Sorbital 5%
- ❖ Mannitol 5%

Table - 2

Liquids used as Distension Media [24,25,26]

Medium	Electrolyte		Surgery
	Yes	No	
Normal Saline	✓		ML
Lactated ringers	✓		ML
Mannitol 5%		✓	MLE
Sorbitol 5%		✓	MLE
Glycine 1.5-2%		✓	MLE
M-Mechanical , L-Laser E - Electro surgery			

Liquid Distension Media

Non electrolyte solutions

Glycine (amino acetic acid) is used as isotonic 2.2% solution or Hypotonic 1.5% irrigating solution. It has a calculated osmolarity of 200 m osm/L & does not contain electrolytes and can be used with electrosurgical procedures. Systemically absorbed glycine is metabolized mainly by deamination to anmonia and transamination to other amino acids particularly serine. Glycine should be used with caution in patients with known liver impairment.

Electrolyte solutions [25,26,27]

Lactated ringers or saline are rapidly becoming the choice of distension media for Hysteroscopy procedures. These mix with blood & become cloudy. These are replaced rapidly so that visualization is possible even in the presence of bleeding. Large volumes are required for a clear vision throughout the procedure. The pressure produced & maximum rate of fluid delivery must be noted. Absorption of fluid causes hypervolemia leading to pulmonary edema. Hyponatremia and hence input & output should be measured.

High Viscosity Distension Medium

Hyskon or Dextran 70

It is a 32% clear solution of Dextran 70, non pyrogenic solution. It does not harm the endometrium. It does not contain electrolytes & thus does not conduct electricity. Refractive index is 1.39. Its viscosity facilitates dilatation of uterine cavity without allowing the solution to drain rapidly from the uterus. Blood and mucus do not mix with Hyskon, hence vision is not impaired. A typical examination requires 50 -100ml Hyskon which is slowly introduced through the Hysteroscope. Insufflation pressures should not exceed 150mm of Hg. Higher pressures cause excessive quantities of liquid to pass through the tubes into peritoneal cavity. It is expensive. It may be associated with anaphylaxis. The instruments must be rinsed carefully after use with hot water.

Instrumentation in Laparoscopy

Laparoscopes[29]

Laparoscopes are available with different angles of view, either straight forward or fore oblique 45˚. Diagnostic & Operative Laparoscopes also come in a variety of sizes from small (5to 7mm) to large (8 to 11mm). Operating Laparoscopes are of greater caliber than diagnostic ones because the operating channel through which the instruments must pass varies in diameter from 3 to 5 mm. In addition the Laparoscope has a magnification

system. The degree of magnification varies with the distance of the Laparoscope from the object, a concept that the surgeon must consider when estimating size through Laparoscope.

Table - 3

Differences in magnification in relation to the distance of the Laparoscope from the object [29,30]

Working distance	Magnification
3mm	10
5mm	6
10mm	3
15mm	2
20mm	1.5
30mm	1
50mm	0.6

Instrumentation in laparoscope[14]

1) 11 mm blade knife.
2) Verres needle for creating pneumoperitoneum.
3) 7mm trocar with pyramidal tip.
4) Cannula with straight end, automatic valve with stop cock for insufflation with outer diameter 7mm.

5) Co_2 insufflators- for safety, a series of gauges monitor pressure and flow. Most insufflators have a maximum 2 liter flow rate and 12mm Hg pressure.
6) Forward oblique telescope 30˚ which gives enlarged view. Diameter 6.5mm fibreoptic light transmission is incorporated.
7) 150 – 250 W Halogen quartz light sources & fibreoptic cables.
8) Second puncture instruments - trocars, sheath, electrosurgical generators, bipolar cautery.

Instruments for uterine manipulation during chormo perturbation

1. Speculum
2. Vulsellum
3. Uterine sound
4. Dilators
5. Leech Wilkinsons canula
6. Syringe
7. Methylene blue
8. Curette

Hysterolaparoscopy In Infertility

Hysteroscopy in infertility [8,9,14]

Hysteroscopy is becoming an increasingly important tool in the evaluation of infertile patient. The endocervical canal, endometrial cavity, endometrium, both tubal ostia are visualized systematically. The presence of gas bubbles near the tubal ostia which get sucked in with fall in intrauterine

pressure may reflect patent tubes. Operative Hysteroscopy further aids the management.

Abnormal findings diagnosed at Hysteroscopy [8,30]

1. Intrauterine synechiae
2. Mullerian fusion defects.
3. Endometrial polyp
4. Submucus myoma
5. Intra uterine septum

Role of operative Hysteroscopy in infertility [19]

1. To take directed biopsy.
2. Excision of endometrial polyps.
3. Resection of submucus fibroids.
4. Dissection and division of intrauterine adhesions.

Contra indications to Hysteroscopy [2,3]

1. Infections
2. Uterine malignancy
3. Pregnancy
4. Perforated uterus
5. Uterine bleeding (relative)

Complications in hysteroscopy

I) While introducing the scope

Uterine perforation

II) During operative procedures

1) Fluid and electrolyte imbalance
2) Uterine perforation

III) Anesthetic complication

1) Aspiration
2) Cardiac complications
3) Pulmonary complications

Laparoscopy in Infertility [17,42]

According to **Cohen et al,** endoscopy is indicated in every infertile patient over the age of 30 years or in any patient regardless of her age who is infertile for 3 years or more. The indications for Diagnostic Laparoscopy in infertility are:

I. When the history is suggestive but no definite cause in detected

1. Koch's infection
2. Repeated genito urinary infection
3. Repeated donor insemination
4. Previous ectopic pregnancy.

5. Previous tubal, uterine or ovarian surgery.
6. Endometriosis.
7. Premature menopause.

II. When the pathology is suspected from bimanual examination or other investigations.

a) Uterus – enlarged / Irregular / Restricted mobility / Small hypoplastic / Malformation

b) Tube –Blocked / Adhesions / Hydrosalphinx / Tubovarian mass

c) Endometriosis

d) Unexplained infertility

e) Following tuboplasty

Contraindications to Laparoscopy [29,43,44]

Frangenheim says, "In my opinion as a Gynecologist ,contra indications exists only if the anaesthetist finds the patient at poor anasthetic risk".

The absolute contra indications would be:

1. Severe cardiac or respiratory disease.
2. Peritonitis
3. Severe ileus and intestinal obstruction.

4. Abdominal / Diaphragmatic hernia.
5. Inexperienced surgeon
6. Haemoperitoneum.

Relative contra indications include

1. Extremes of body weight
2. Advanced intra uterine pregnancy
3. Large intra abdominal mass
4. Prior abdominal surgery
5. Carcinomatosis

Complications of Laparoscopy [29,30,43,44]

Fear et al said "little doubt that with proper care, Laparoscopy is a safe procedure and this is attested by the very low complication rate. Meticulous adherence to proper techniques is essential to prevent complications. Appropriate training of operator and experience are therefore very important prerequisites.

The British Laparoscopy survey in 1978 showed that the complication rate was 3.2% in the regions where Laparoscopy were performed was more often compared to 5% where Laparoscopy was less common. **Streptoe** (1967) reported no major complications in his series of 500 cases. **N.D.Motoshaw** had a complicate rate of 0.3%. **Prof. Semm (1984)**

reported 0.28% overall complication rate in 8943 laparoscopies of which 6114 were operative Laparoscopies.

The complications consisted of vessel damage, hollow viscus and solid organ perforation and anaesthetic complications.10 laparotomies were performed because of complications. No deaths were reported.

The present series also did not experience any complication.

Complications of Laparoscopy

I. **Failure to complete the procedure due to inability to establish pneumoperitoneum.**

   Presence of extensive adhesions**.**

II. **Complications associated with induction of pneumo peritoneum.**

   1. Extra peritoneal insufflation
   2. Mediastinal Emphysema
   3. Pneumothorax
   4. Pneumo omentum
   5. Penetration of hollow viscera
   6. Blood vessel injuries
   7. Gas embolism
   8. Puncture of liver & spleen

III. Complications associated with trocar insertion

1. Bleeding from abdominal wall
2. Blood vessel injury
3. Injury to hollow viscus
4. Injuries to liver & spleen

IV. Complications associated with Operative Laparoscopy

1. Bleeding
2. Mechanical trauma
3. The Electrosurgical injury

V. Other complications

1. Bleeding from tenaculum site
2. Uterine perforation
3. PID
4. Incisional hernia
5. Associated injuries

Anasthetic complications

1. Aspiration
2. Cardiac Arrhythmias
3. Pulmonary complications
4. Complications related to regional anasthesia.

PROCEDURE

Infertility clinic should be designed to have an OPD, laboratory, imaging facilities, operation theatre with blood bank support.

Preliminary Studies

Prior to hyterolaparoscopy detailed evaluation of the couple as a whole was made which included sexual history, coital frequency and timing. Male partner was subjected to semen analysis and VDRL and if necessary, referred to the Urologist. Only those with normal male factors were included in the study. Regarding the female partner complete history which includes menstrual history, marital history and past history with particular reference to PID,TB. Thorough general examination including breast and thyroid was done.Examination of external genitalia , speculum and bimanual pelvic examination were done to rule out uterine and adnexal pathology.Basic investigations like Hemoglobin, urine analysis,blood sugar,blood urea,serum creatinine, VDRL,X-ray chest and ECG were done.Chest physician opinion obtained. Anasthetic fitness obtained. Patients with contraindications to diagnostic Hysterolaparoscopy and anasthesia were excluded.Patients were admitted on the day prior to surgery. An informed consent was obtained after explaining the procedure, risk and complication to the patient. The procedure was timed to the premenstrual period, as endometrial biopsy was also taken for evidence of ovulation.

Preparation

1. Overnight fasting
2. Preparation of abdomen and perineum.
3. Bowel preparation by laxatives.
4. PGE1 tablet -400 micrograms kept in posterior fornix 6 hours prior to surgery

Operation theatre

Every operating room designed for hysterolaparoscopy should meet the criteria for a general operating room and fully equipped with emergency drugs and equipments .Major complications are unusual in a laparoscopy but to be on the watch is a must.

Patient positioning

The operating table must be able to allow various patient positions that are essential for Gynecological surgery with facilities to reverse to horizontal position immediately. The patient is placed in modified lithotomy with legs flexed at 45˚ and the buttocks brought just beyond the edge of the table.

Anasthesia

GA/ IV ketamine by an anasthetist

Technique [23,24]

Hysteroscopy

Patient positioned, painted & draped. Under aseptic conditions, the cervix is exposed with a Sim's speculum and its anterior lip is held with a vulsellum. Hysteroscope is introduced after sounding the uterus. The light generator is switched on and the fibreoptic cable is attached to the telescope. The distending medium (Normal Saline) is delivered into the uterine cavity. The scope is advanced into the cervical canal. The flow rate is adjusted to deliver 30cc/mt. The endocervical canal is examined as it is being distended. As the endoscope is advanced the distending media separates the walls of the endocervix allowing an excellent view of the endocervical folds & crypts.

It is necessary to pause for a moment at the internal os when the pressure of the distending medium allows the orifice to dilate further when the Hysteroscope is introduced into the uterine cavity . Flow is adjusted to a rate of 60cc/ mt.

The uterine cavity is explored in a systematic manner, anterior & posterior walls, side walls, fundus, and cornua. Routinely dilatation of

cervix should be avoided because even careful and gentle insertion of cervical dilators will traumatize the endocervix and endometrium. Hence PGE1 is used for passive dilatation of cervix Typically the endocervical canal shows longitudinal folds, papillae and clefts . The vascular pattern of the normal endocervix reveals branching tree like vessels. These are especially well observed. With a focusing hysteroscopy the internal os appears as constriction at the top of the endocervical canal. The isthmus is a cylindrical extension above the os. The corpus is a capacious cavity. The tubal ostia are visible at the upper extremities of the fundal cornua and show great variation in their appearance at the angle of entry into the uterine cavity.[34] The uterine mucosa, endometrium is smooth and pink white in colour during the proliferative phase. The gland opening appears as white ringed elevation surrounded with net like vessels.

During the secretory phase of the cycle the endometrium is lush and velvety.It protrudes into the cavity irregularly and can be easily mistaken for small polyp[30]. The hue of secretory endometrium is deep pink.[30]. The interior of the cavity particularly when liquid media are used appears cloudy with fine debris floating in the medium. When Co_2 is the distending medium, the endometrium is artificiallty flattened. Although the cornua are easily recognized, the tubal ostia may not be seen during the later phase of menstrual cycle[33,34]. The thickness of endometrium can be easily appreciated

by placing pressure on the telescope & pushing on the posterior wall of the uterus. This maneuver creates a groove in the endometrium. Once this is over, the Hysteroscope is removed [33]. Dilator is introduced through the cervix for uterine elevation during laparoscopy.

Laparoscopy

Procedure

Anterior abdominal wall is elevated. With a 11m blade, a superficial incision is made on the skin subumblically about 1cm.Verres needle is introduced in the direction of the coccyx taking care to penetrate all the layers of the abdomen individually & enter the peritoneal cavity,aspirate & see to get air in it. Pneumoperitoneum is created by insufflating 1-2 lts of Co_2 taking care to see that all quadrants of the abdomen is filling. The verres needle is withdrawn & the trocar and canula introduced in the same direction as the verres needle. This might be easy as pneumoperitoneum is already created. A light source is connected to the scope & is introduced into the peritoneum. A thorough check up of all organs is done in a methodical manner.

The second instrument may be a simple probe or atraumatic forceps. The second instrument can be inserted supra pubically in the midline or more laterally.A pyramidal trocar is easier to insert than a conical one but

the former does carry more risk of puncturing vessels & causing bleeding into the abdominal cavity.

The stages in the examination consists of

a) Taking an overall view of the internal female organs and peritoneal pouches. A double puncture technique allows manipulation of the tube and ovary.
b) Inspection of the uterus for congenital anomalies, myomas and tubercles. The uterus is lowered and the anterior surface of uterus as well as the uterovesical reflection are examined. Endometriotic implants on the anterior surface can be missed if the uterus is raised & the posterior surface is examined.
c) The ovaries are examined for morphology and presence of cysts and corpus luteum and the relation between ovaries and tubes, presence of ovarian adhesions. The adnexa is thoroughly viewed. The medial and lateral surface of the ovary is seen. With use of the ancillary probe, the ovary can be raised to examine the lateral surface.

Examination of the ovary provides a guide to ovarian function and the appearance should therefore be correlated with the phase of menstrual cycle. The ovaries are white and atrophic in non ovulatory patients. In the

preovulatory phase, the dominant follicle may be 25mm in diameter & its vascularity becomes very obvious immediately prior to rupture or ovulation.

If the Laparoscopy is performed just after ovulation the stigma is seen marking the site of escape of the ovum and a few days later the yellowish colour of the corpus luteum is obvious.Ovarian manipulation should be carefully carried out to prevent damage to the fragile vascular structures.

If the ovary is adherent, then gentle pressure from the blunt probe may free the ovary from its attachment. Endometriosis should be carefully looked for on the ovary & the pelvic sidewall. Force should not be used to separate a densely adherent ovary at the time of Diagnostic Laparoscopy.

d) Observations of tube in panoramic view & in more detail along its entire lenght especially fimbria for adhesions & patency. The proximal portion is examined for nodules which may be indicative of salphingitis isthmic nodosa. The tube is viewed in its entirety for the presence of endometriosis or adhesions. The fimbriae are carefully manipulated & assessed to rule out prefimbrial phimosis or fine fimbrial adhesions that may impede ovum pick up.

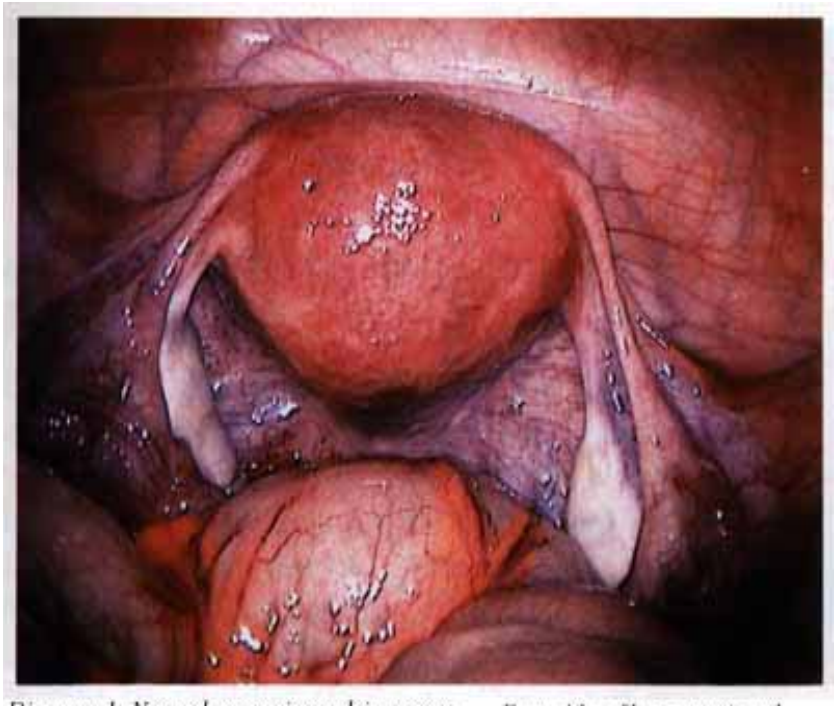
e) Inspection of the cul-de-sac, uterosacral ligaments & broad ligament for endometriosis, presence of tubercles on tubes, omentum or intestine.

The presence of periadnexal adhesions may prevent adequate visualization. It may be necessary to insert other ancillary instruments to dissect the adhesions enough to make an adequate assessment. Extensive lysis of adhesion should not be performed at the time of diagnostic laparoscopy without adequate informed consent. Finally dilute methylene blue solution is injected through the cervix. Free flow of dye into the peritoneal cavity is usually preceded by air bubble. The dye distends the tubes & drips form the fimbriae to collect in the pouch of Douglas.

At the end of the examination the Laparoscope is withdrawn, the trocar is then introduced into the cannula & the operating table is straightened. With the patient flat, gas is allowed to escape assisted by bimanual compression of the abdomen. The trocar & cannula are then removed. The lesser the residual gas, the less would be the post-operative discomfort. The incision is closed with 2-0 chromic catgut.

Endometrial curettage is done and the specimen is sent for Histopathological examination. The patient's pulse, BP and respiration are checked before transferring the patient to the post operative ward. She is permitted oral fluids after 6 hours & solid foods after 12 hours. The patient is kept in the hospital for 24 hours and discharged home

LAPAROSCOPIC VIEW OF PELVIC ORGANS



MATERIALS AND METHODS

MATERIALS AND METHODS

This prospective study on the role of Hysterolaparoscopy as a routine investigative procedure for primary infertility was conducted at the Department of Obstetrics and Gynecology, Government Kilpuak Medical College Hospital, Chennai – 10, during the period from September 2007 to October 2009.

All those patients who satisfied the inclusion criteria mentioned below were included in the study and those who had one or more criteria mentioned vide exclusion criteria were deleted from the study. Thus 200 patients were selected for the study.

INCLUSION CRITERIA

1. Nulliparous women married for >1 year.
2. Not conceived in spite of regular marital relationship.
3. Male factor found normal.

EXCLUSION CRITERIA

1. Any certified conception irrespective of site or outcome.
2. Use of contraception.
3. Any other medical or surgical disorders which precludes the use of Hysterolaparoscopy as a diagnostic modality.

OBSERVATION, ANALYSIS & DISCUSSION

OBSERVATION, ANALYSIS & DISCUSSION

I.AGE GROUP:

An important factor that has to be viewed seriously & considered differentially in the investigation and management of infertility is the age of the patient. The reduction in fertility and fecundity with advancing age has been well documented.

Table - 4

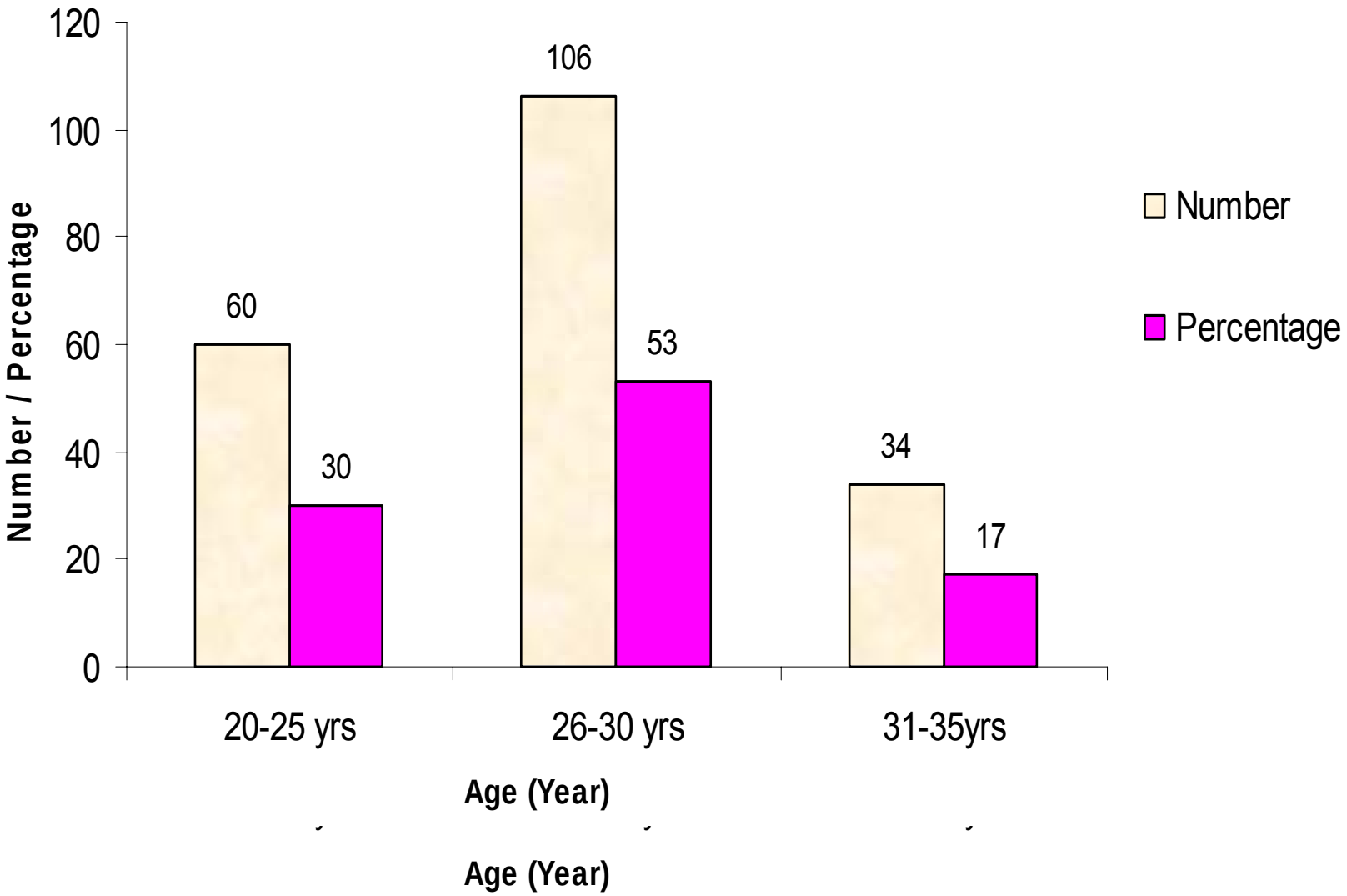
Age wise analysis

Age in years	Number	Percentage
20-25 yrs	60.	30%
26-30 yrs	106.	53%
31-35yrs	34.	17%

The majority of the patients (ie) 106 patient (53%) were in the age group of 26-30 yrs. 60 patients (30%) were in the age group of 20-25 years. There were 34 patients (17%) in the age group of 31-35 years.

The youngest patient in the series was 20 years. The oldest patient in the series was 35 years. These were no patients over the age of 35 years. This may not exactly reflect the decrease in infertility at a latter age but may be the reluctance of the women in our society to seek treatment for primary infertility over 35years.

AGE WISE ANALYSIS
Figure - 1



Age (Year)

II.DURATION OF MARRIED LIFE

An equally important consideration like age in the management and successful outcome of the problems of infertility is the period of infertility. The longer this duration, less are the chances of successful outcome. It is known that the pathological lesions tend to advance in severity as the years pass.

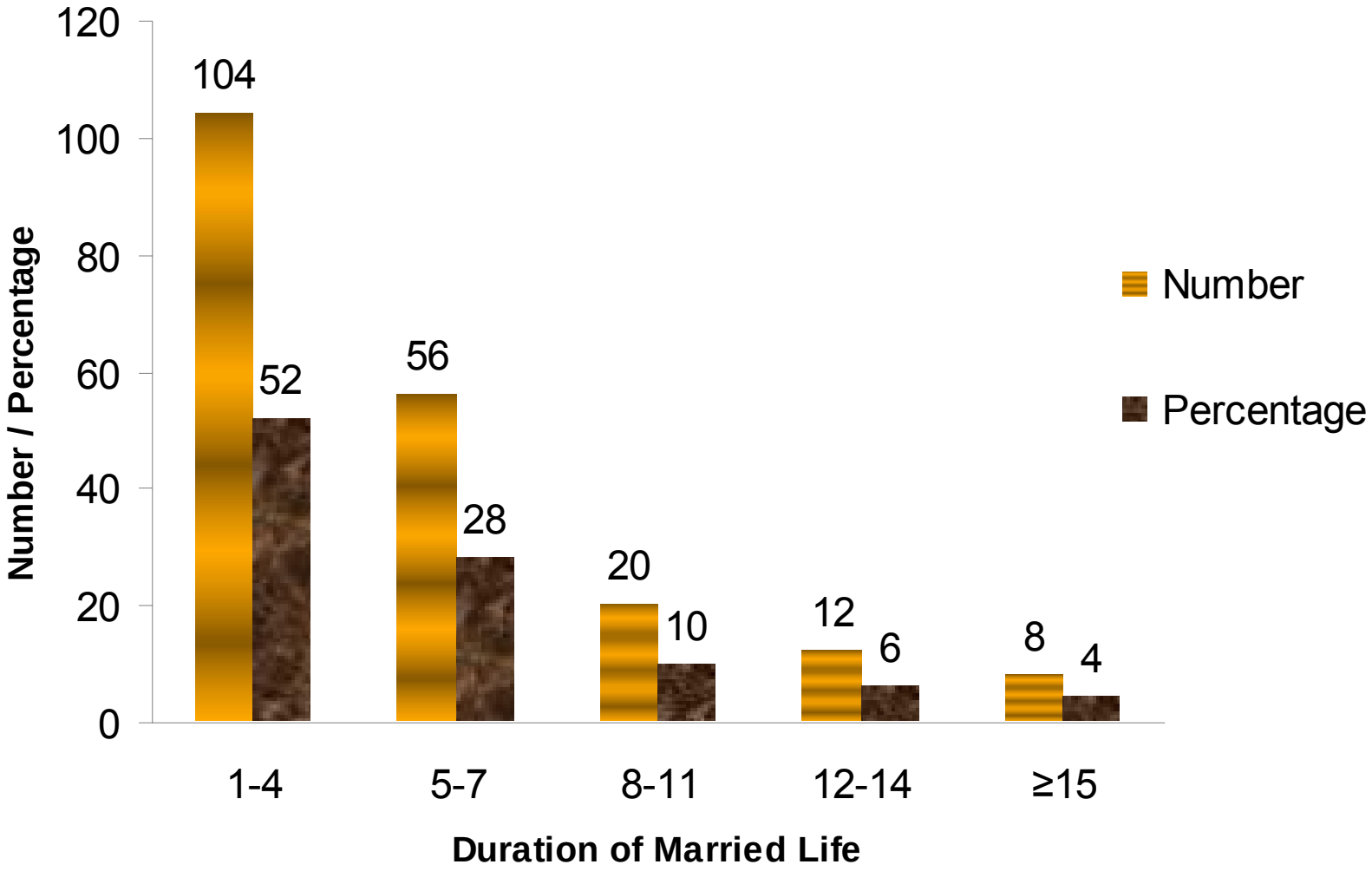
Table - 5

Duration of Married Life

Years	Number	Percentage
1-4	104	52%
5-7	56	28%
8-11	20	10%
12-14	12	6%
≥15	8	4%

104 patients (52%) were married for 1-5yrs. 56 patients (28%) were married for 5-7 yrs. 20 patients (10%) were married for 8-11yrs.12 patients (6%) were married for 12-14yrs. 8 patients (4%) were married for 15yrs and above.

DURATION OF MARRIED LIFE
Figure - 2



III. FINDINGS AT HYSTEROLAPAROSCOPY

The significance of endoscopic evaluation of infertile female is uncontested. Hystero Laparoscopic findings in infertile patients are reviewed in the following table.

Table-6

Hystero Laparoscopic Findings in Infertile Patients

Author	Year	No. of patients	Hystero Laparoscopic Findings	
			Normal %	Abnormal %
Streptoe	1975	74	65	35
Fear	1985	27	22	78
Cohen	1988	78	37	63
Meathius	1992	207	43	57
Gomel	1997	300	39	61
Goldenberg	2003	108	69	31
Pathour	2005	637	74	26
Present series	2007	200	62.5%	37.5%

Normal study

125 women (ie) 62.5% had normal uterus both hysterolaparoscopically, both ovaries being normal, with evidence of ovulation, tubes being patent and normal and no other abnormality noted.

In 7 cases abnormalities were detected both Hysteroscopically and laparoscopically as detailed below :

Table -7

No.	Hysteroscopic abnormality	Laparoscopic abnormality	No. of cases
1	Sub mucous fibroid	Tubal factors	4
2	Sub mucous fibroid	Polycystic ovaries, pelvic Adhesions	2
3	Intra uterine adhesions	Tuboovarian mass, subserous fibroid	1

In 2 cases, uterine cavity abnormalities were detected Hysteroscopically where as no abnormality was detected Laparoscopically.

In other 66 cases Hysteroscopy proved normal uterine cavity but abnormalities were detected by Laparoscopy.

Analysis of patients with single factor abnormality

Among the 75 women in whom abnormalities were detected single factor abnormality was noted in 50 patients (ie) 66.4%. The major single factor abnormality was confined to the ovaries either in the form of cystic ovaries (or) proven anovulation or endometriosis. One patient had septate uterus ; one had submucous polyp and one had tubal abnormality alone.

Analysis of patients with 2 factor abnormalities

19 patients (25.3%) had 2 factor abnormalities.

1) 8 patients had ovarian factor and peritubal adhesions as the cause.
2) 3 patients had tubal factors and pelvic adhesions as the cause.
3) 4 patients had tubal factors and submucous fibroid as the cause of infertility.
4) 4 patients had ovarian factors and tubal factors as the cause of infertility.

Analysis of patient with more than 2 factors abnormal

6 patients (8%) had multiple contributary factors in the form of

1. Tuboovarian mass, Fibroid, Intrauterine adhesions – 1 patient
2. Hydrosalphinx, pelvic adhesions , polycystic ovaries – 1 patient
3. Submucous Fibroid, polycystic ovaries, pelvic ahesions – 2 patients
4. Subserous Fibroid uterus, polycystic ovaries, pelvic adhesions -2 patients

IV. OVARIAN FACTORS

The major single abnormality was in the ovary in 47 out of 200 patients having single abnormality being in the form of cystic ovaries or with proven anovulation.

Table -8

Study of the Ovaries

Classification	Number	Percentage
Normal	153	76.5%
Poly cystic	39	19.5%
Large ovarian cyst	2	1%
Tuboovarian mass	3	1.5%
Endometriosis	3	1.5%

Ovaries were normal in 153 patients (76.52%). In rest of the 47 cases Poly cystic ovaries were seen in 39 patients (9.5%). Large ovarian cyst was present in 2 patients (1%) Tuboovarian mass was seen in 3 patients (1.5%) and endometriosis was noted in 3 patients (1.5%).

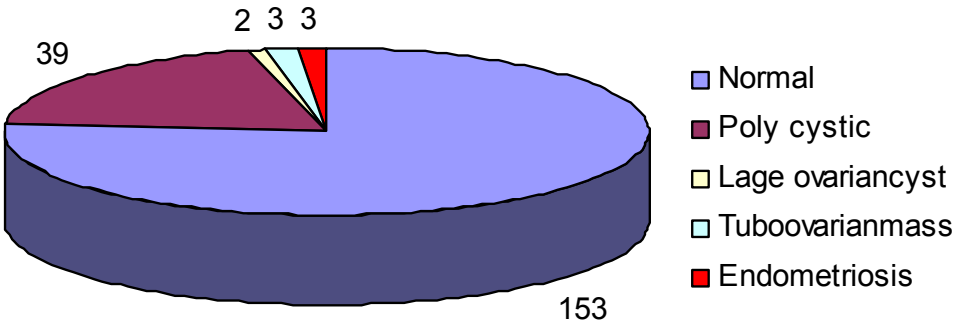
Table -9

AGE WISE ANALYSIS OF OVARIAN FACTORS

Age	Normal	Abnormal	Total
20-25	44 (28.8%)	16 (34%)	60
26-30	85(55.6%)	21(44.7%)	106
31-35	24(15.7%)	10(21.3%)	34
Total	153	47	200

P-value = 0.4070
The association is insignificant

STUDY OF THE OVARIES
Figure - 3



AGE WISE ANALYSIS OF OVARIAN FACTORS
Figure - 4

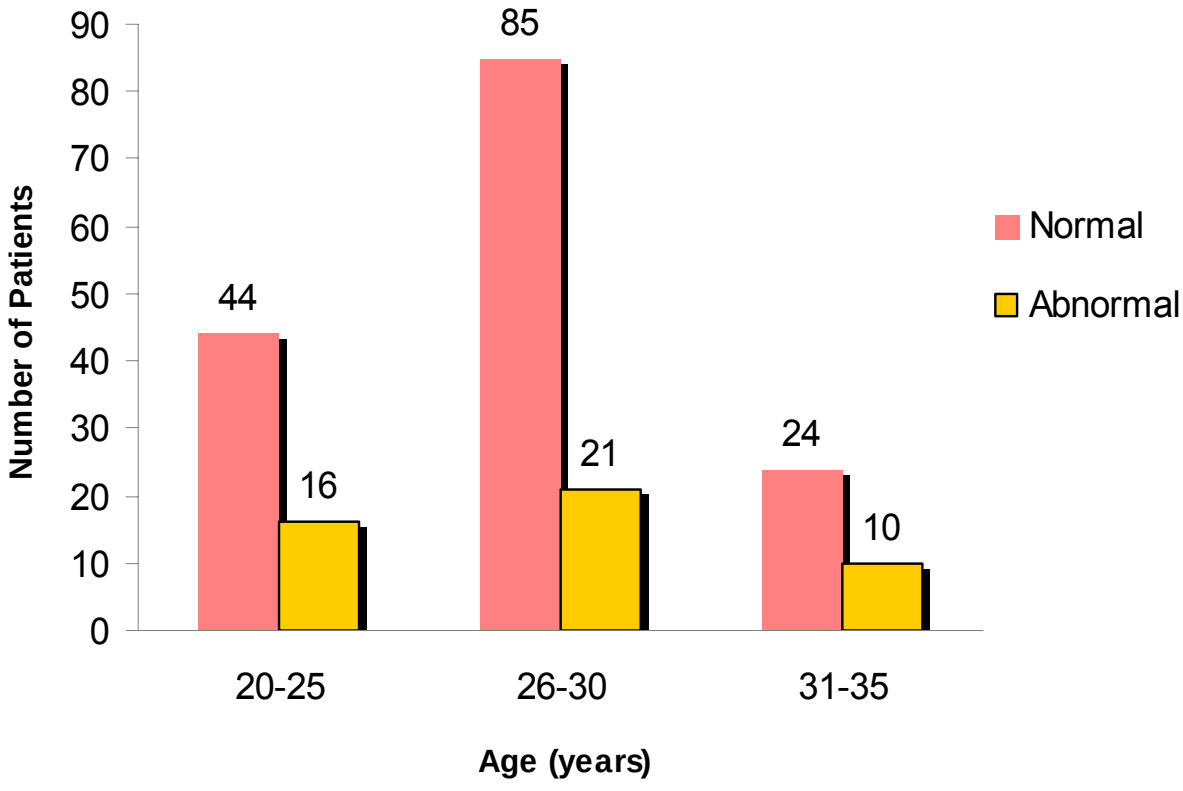


Table- 10

ANALYSIS OF OVARIAN FACTORS WITH RESPECT TO DURATION OF MARRIAGE

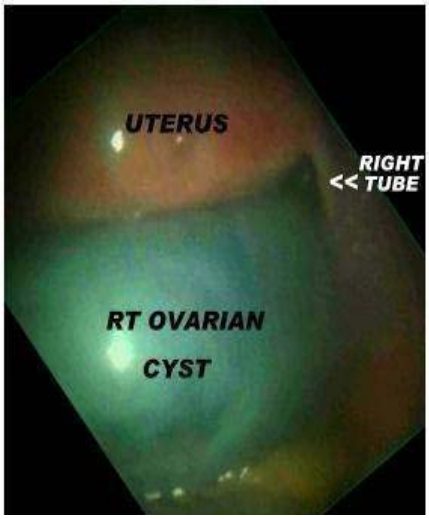
Duration	Normal	Abnormal	Total
1-4 (yrs)	83(54.2%)	21(44.7%)	104
5-7(yrs)	40(26.1%)	16(34%)	56
8-11(yrs)	14(9.2%)	6(12.8%)	20
12-14(yrs)	10(6.5%)	2(4.3%)	12
≥15(yrs)	6(3.9%)	2(4.3%)	8
Total	153	47	200

Chi Square = 2.226

Degree of freedom = 4

P-value = 0.6943

The association is insignificant



ANALYSIS OF OVARIAN FACTORS WITH RESPECT TO DURATION OF MARRIAGE

Figure - 5

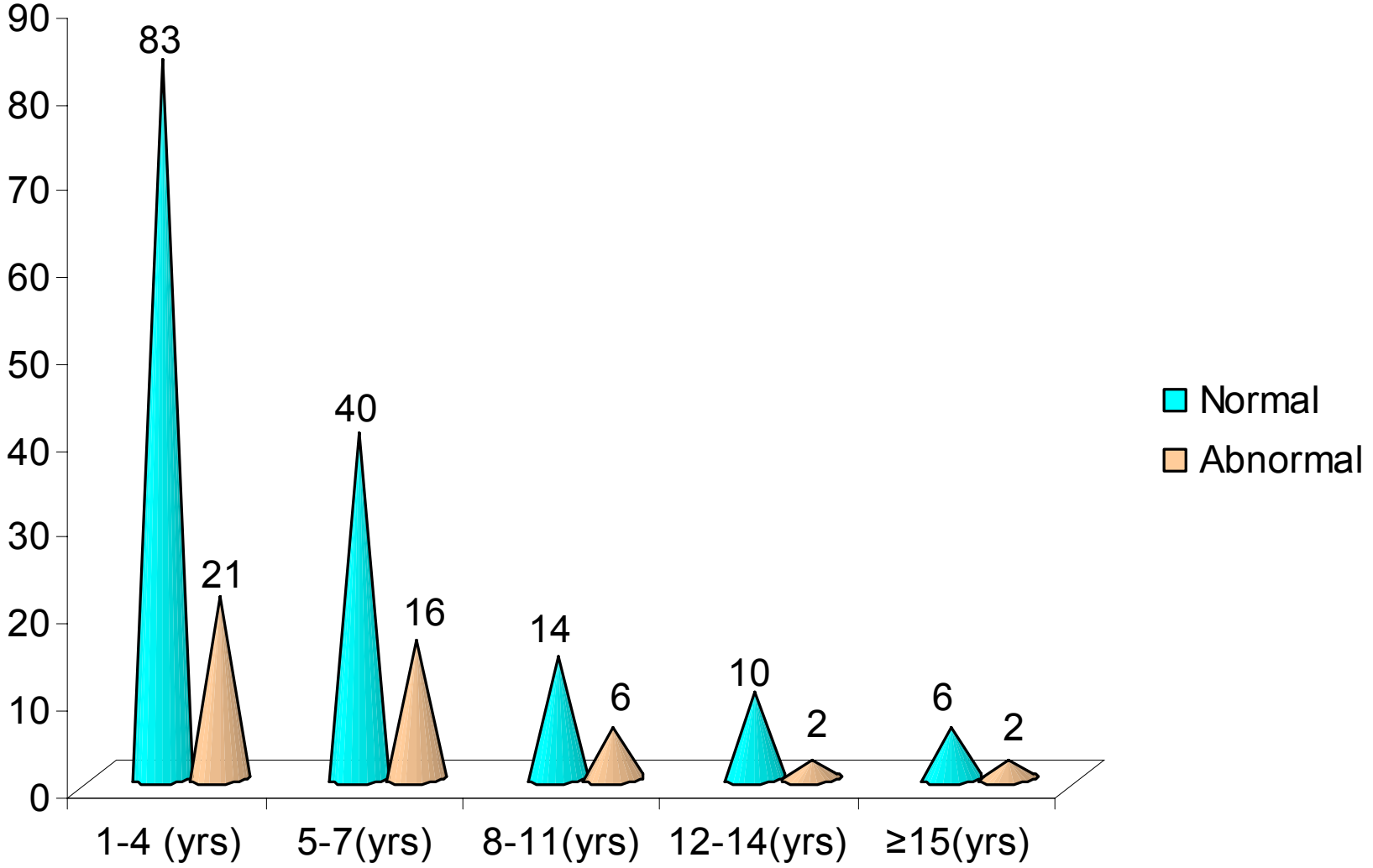


Table- 11

Anovulation (Or) Ovarian Factors As A Cause Of Infertility

Name	Year	Percentage
Katayama	1989	23
Rowland	1990	24
Peppuela	1993	10-15
Kandang kerbau hospital	1996-99	23.8
Lister	2002	5
Present Study	**2007**	**22%**

Most of the earlier studies showed ovarian factors as a cause of infertility in around 20-24% of patients. It was 22% in the present study.

39 patients showed evidence of cystic ovaries. An analysis of the endometrium of these patients showed the following.

Table -12

Endometrial biopsy analysis of patients showing cystic ovaries

Type	Number	Percentage
Proliferative	31	79.49%
Secretory	5	12.83%
Tuberculosis	1	2.56%
Simple hyperplasia	2	5.12%

Figure: 6

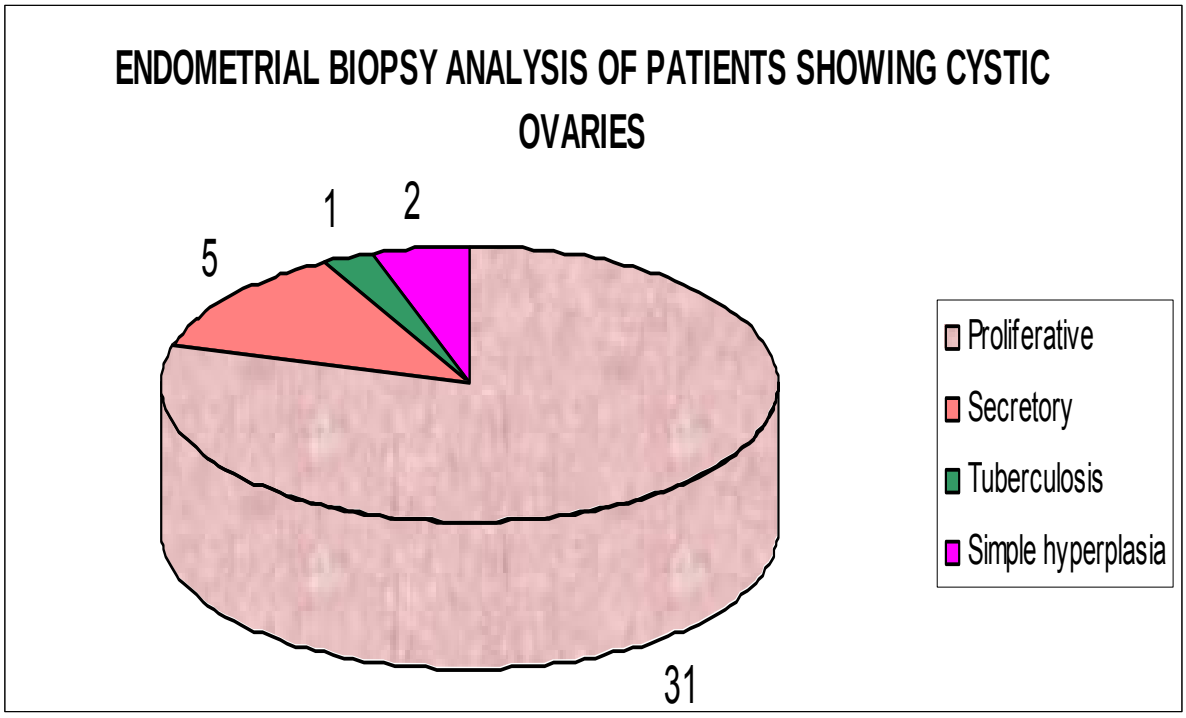


Table -13

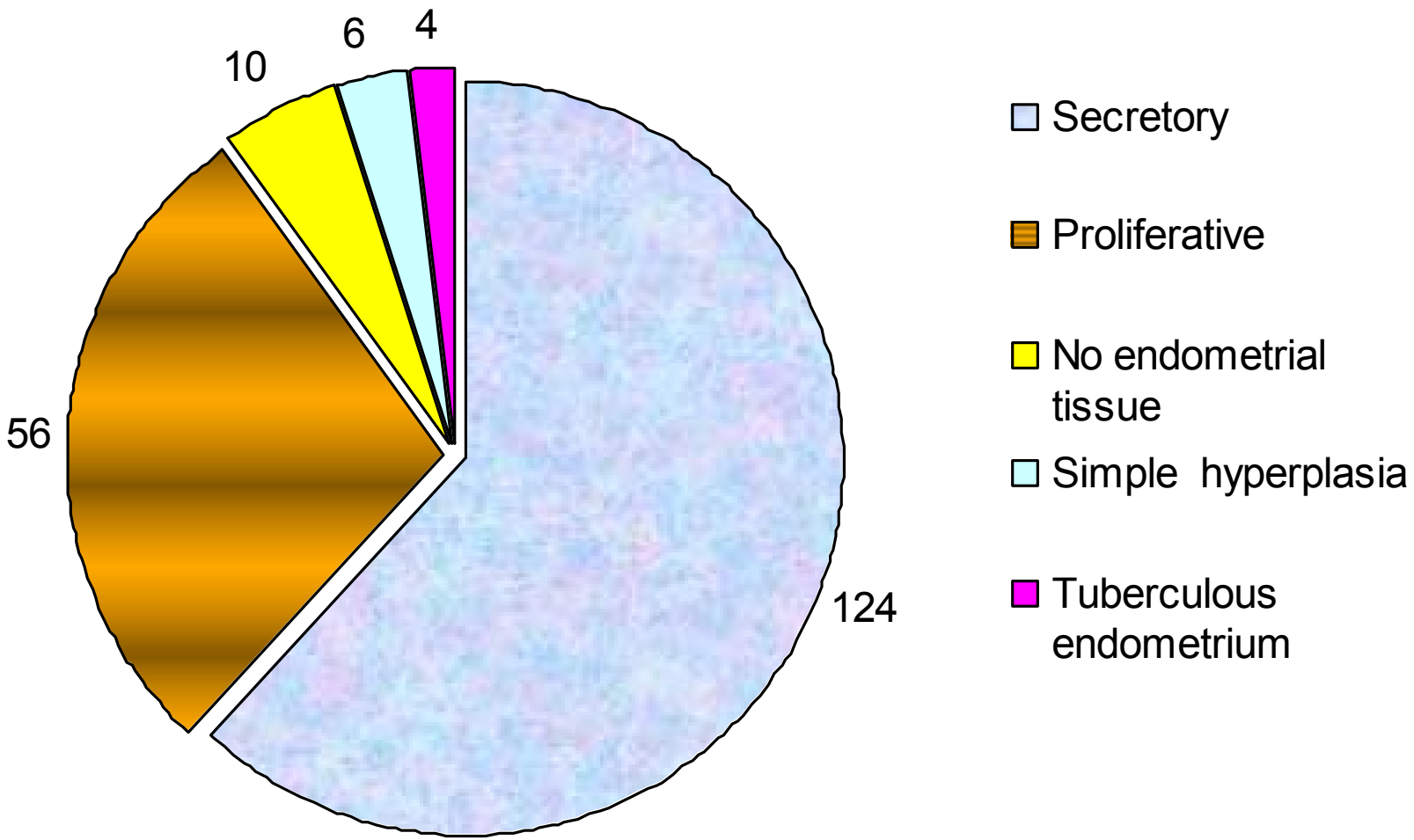
Endometrial biopsy analysis

Type	Number	Percentage
Secretory	124	62%
Proliferative	56	28%
No endometrial tissue	10	5%
Simple hyperplasia	6	3%
Tuberculous endometrium	4	2%

42 patients having evidence of anovulation were started on induction of ovulation with tab. Clomiphene 50mg od from D2 to D6 for 5 days. The dosage of clomiphene was increased upto 150mg. Follicular monitoring was done to assess follicular growth, confirm ovulation and timing of coitus.

25 patients (59.5%) responded to clomiphene induction and showed evidence of ovulation by ultrasound. Among them 12 women conceived have delivered so far & there are 3 ongoing pregnancies. 2 patients who had ovarian cyst 7x8 cm, 6x8 cm had laparoscopic puncture of ovarian cyst done.

ENDOMETRIAL BIOPSY ANALYSIS
Figure - 7



V.TUBAL FACTORS

Table -14

Tubal factors as a cause of infertility in different series

Name	**Year**	**Percentage**
Frangeinheim	1978	77%
Drake et al	1978	75%
Katayama	1989	12%
Rowland	1993	34%
Peppuela	1993.	20-30%
Kandangkerbau Hospital	1996-1999	10.6%
Lister	2002	30%
Present study	**2007**	**22.5%**

In majority of studies, tubal factors contributed to around 15-30% of causes of infertility and in the present series it was 22.5%.

Normal study: In this study, out of 200 patients, 155 patients had evidence of bilateral patent tubes. Both the tubes were healthy and did not show any evidence of abnormalities like tuberculosis, endometriosis and adhesions.

Table -15

Study of the fallopian tubes

Classification	Number	Percentage
Normal	169	84.5%
Long tubes	5	2.5%
Hydrosalphinx	10	5%
Fimbrial abnormalities	3	1.5%
Adhesions	5	2.5%
Tubercles	5	2.5%
Tuboovarian mass	3	1.5%
Congenital malformations	-	-

The Fallopian tubes appeared normal in 169 patients (84.5%). The tubes were long and convoluted in 5 patients (2.5%). Hydrosalphinx was seen in 10patients (5%). Fimbrial abnormalities were present in 3 patients (1.5%) of which 2 patients had fimbrial cyst 1x1 cm and 1 patient had fimbrial adhesions.

In 5 patients (2.5%) the tubes were bound by adhesions and laparoscopic adhesiolysis was done. Tubercles were noted over the tubes in 5 patients (25%). Tuboovarian mass was present in 3 patients (1.5%). There were no congenital malformation of the tubes in this study.

STUDY OF FALLOPIAN TUBES
Figure - 8

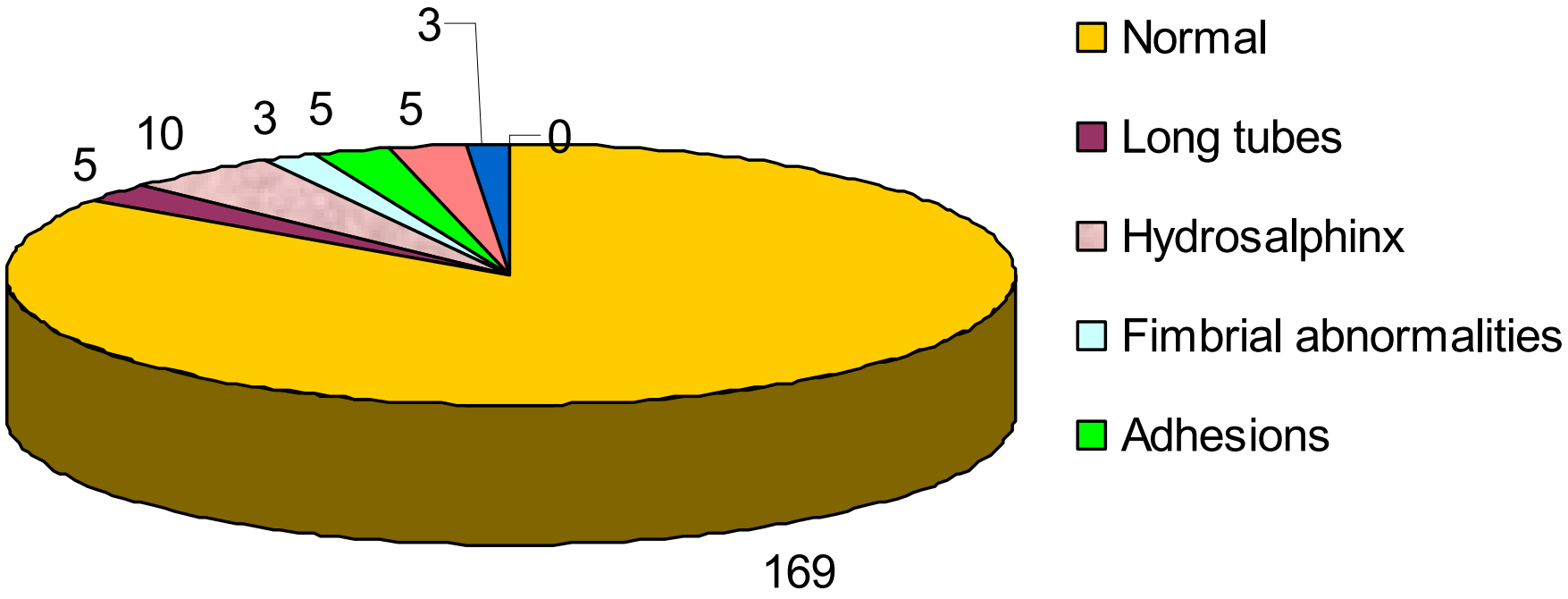


Table - 16

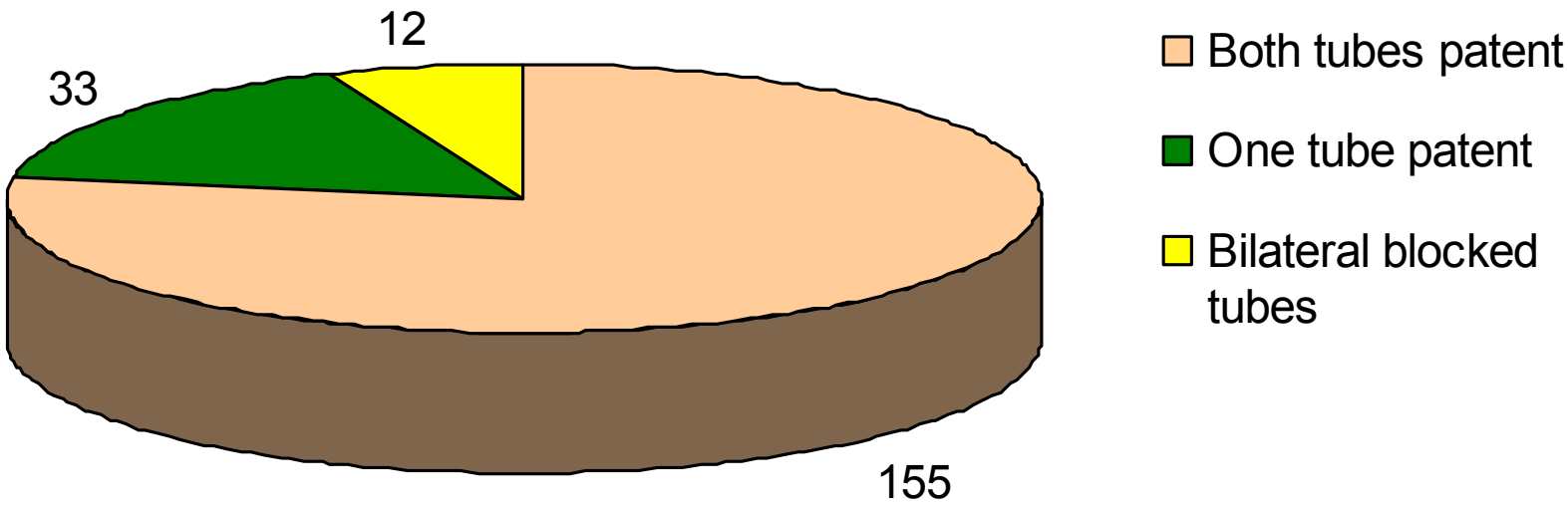
Study of the fallopian tubes – Chromopertubation

Classification	Number	Percentage
Both tubes patent	155	77.5%
One tube patent	33	16.5%
Bilateral blocked tubes	12	6%

Bilateral tubal block

- 12 patients (6%) had bilateral tubal block .
- On laparotomy, 3 patients showed evidence of bilateral free spill & hence they did not require any treatment.
- 4 patients underwent Bilateral isthmo cornual anastomoses. Second look laparoscopy showed evidence of bilateral spill.
- Myomectomy was done in 2 patients showing fibroid uterus and bilateral tubal block. Subsequently free spill was noted in both tubes.
- 3 patients with bilateral tubal block had evidence of gross tubal damage and they could not be taken up for surgical correction.

STUDY OF FALLOPIAN TUBES - CHROMOPERTUBATION
Figure - 9



Unilateral tubal block was noted in 33 patients

- 12 patients with unilateral block had evidence of healthy tubes on both sides. No evidence of endometriosis, tuberculosis or adhesion. Spill was noted in one side only. These patients are on follow up.
- 3 patients had unilateral surgical removal of tube and ovary due to twisted ovarian cyst elsewhere.
- 8 patients had a normal tube on one side & the other tube showed evidence of gross hydrosalphinx and adhesions not amenable to surgery.

Table -17

AGE WISE ANALYSIS OF TUBAL FACTORS

Age	Normal	Abnormal	Total
20-25	47(30.3%)	13 (28.9%)	60
26-30	82(52.9%)	24(53.3%)	106
31-35	26(16.8%)	8(17.8%)	34
Total	155	45	200

Chi Square = 0.04577
Degress of Freedom = 2
P-value = 0.9774
The association is insignificant

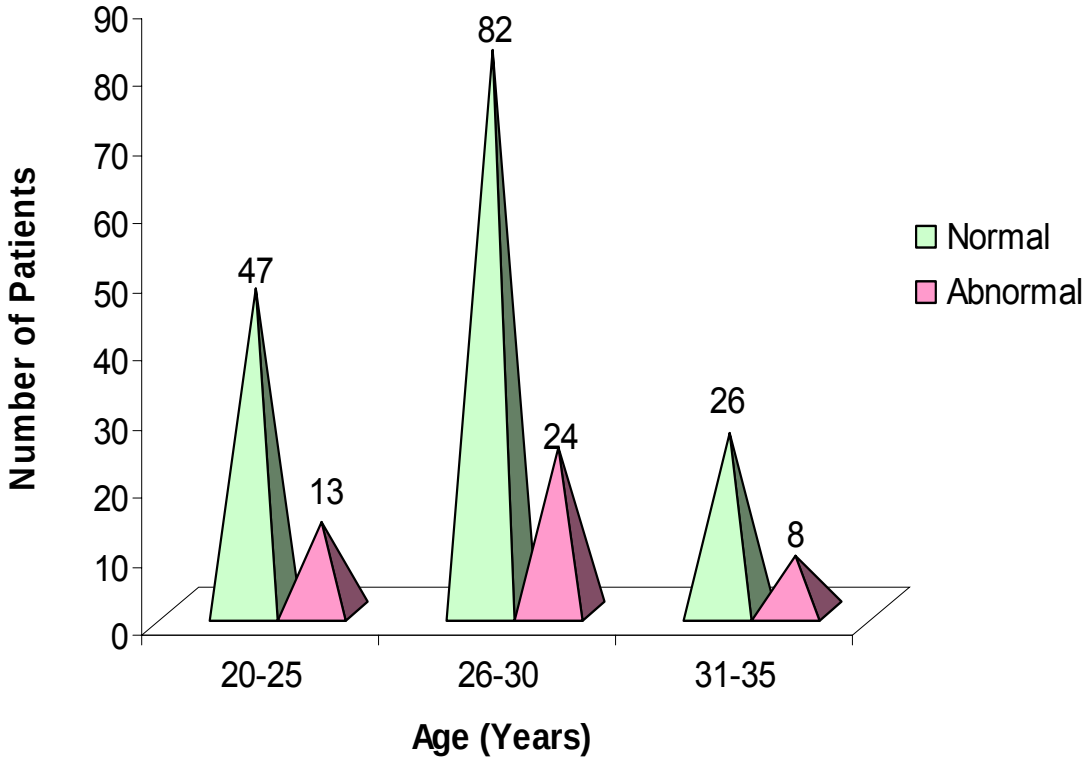
Table -18

ANALYSIS OF TUBAL FACTORS WITH RESPECT TO DURATION OF MARRIAGE

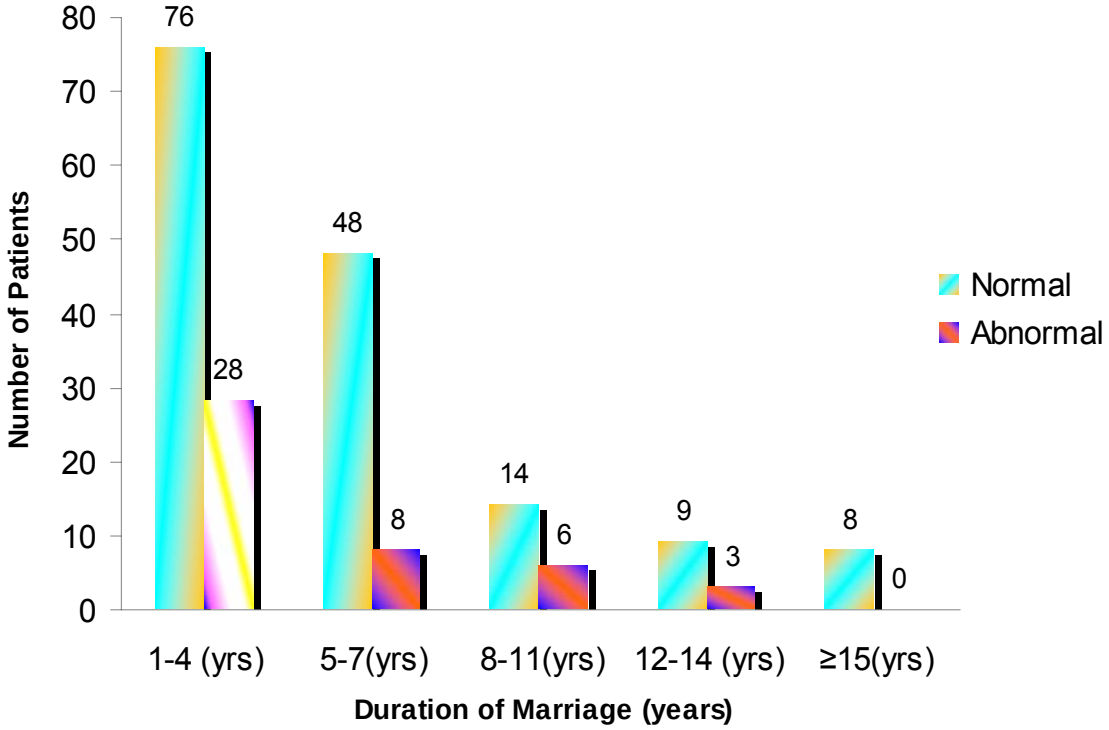
Duration	Normal	Abnormal	Total
1-4 (yrs)	76(49%)	28(62.2%)	104
5-7(yrs)	48(31%)	8(17.8%)	56
8-11(yrs)	14(9%)	6(13.3%)	20
12-14 (yrs)	9(5.8%)	3(6.7%)	12
≥15(yrs)	8(5.2%)	0	8
Total	155	45	200

Chi Square = 6.344
Degree of freedom = 4
P-value = 0.1749
The association is insignificant

AGE WISE ANALYSIS OF TUBAL FACTORS
Figure - 10



ANALYSIS OF TUBAL FACTORS WITH RESPECT TO DURATION OF MARRIAGE
Figure - 11



VI. UTERINE FACTORS

In this study of 200 patients, uterus was found to be normal in 177 patients (88.5%). Fibroids were seen in 20 patients (10%). Myomectomy was done for 3 patients. The other 17 were seedling fibroids and they are under observation with ultrasound monitoring.

The patient with septate uterus underwent septal resection hysteroscopically. The patient with intrauterine adhesions was done hysteroscopic adhesiolysis.

Table -19

Study of the Uterus

Classification	Number	Percentage
Normal	177	88.5%
Large fibroids	3	1.5%
Seedling fibroids	17	8.5%`
Septate uterus	1	0.5%
Submucus fibroid	1	0.5%
Intra uterine adhesions	1	0.5%

STUDY OF THE UTERUS
Figure - 12

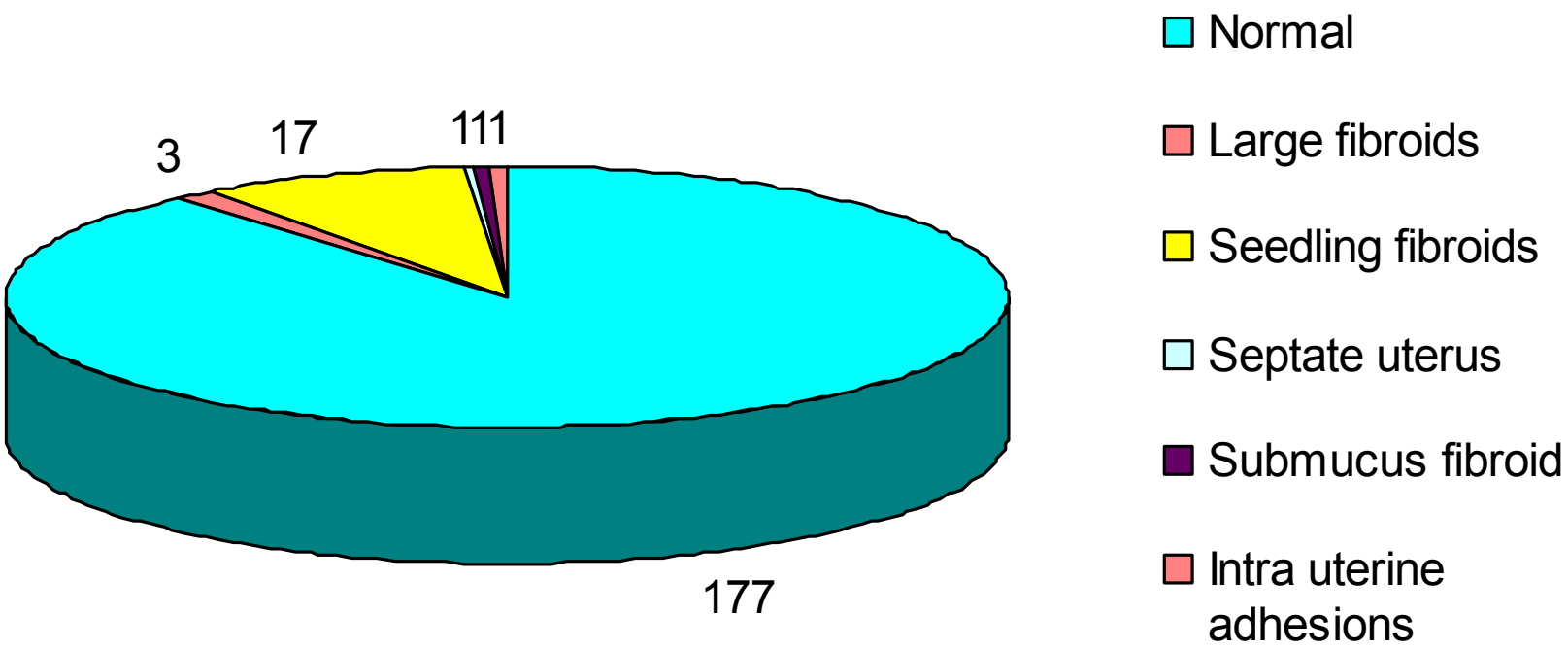


Table -20

AGE WISE ANALYSIS OF UTERINE FACTORS

Age	Normal	Abnormal	Total
20-25	55(31.1%)	5(21.7%)	60
26-30	93(52.5%)	13(56.5%)	106
31-35	29(16.4%)	5(21.7%)	34
Total	177	23	200

Chi Square = 0.9953
P-value = 0.6079
The association is insignificant

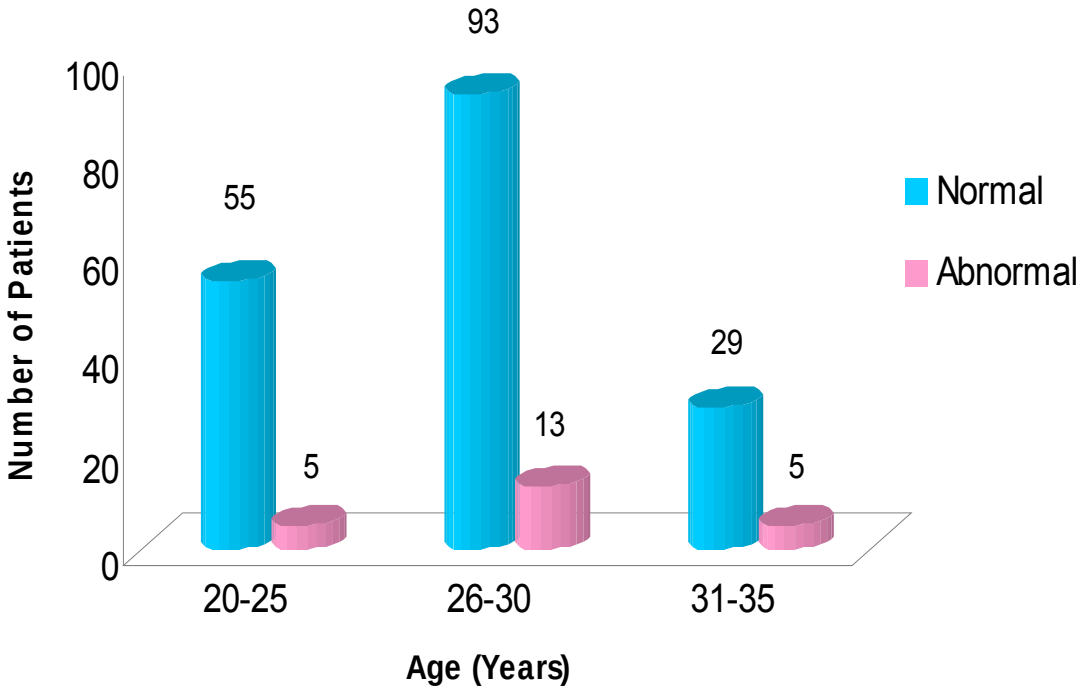
Table -21

ANALYSIS OF UTERINE FACTORS WITH RESPECT TO DURATION OF MARRIAGE

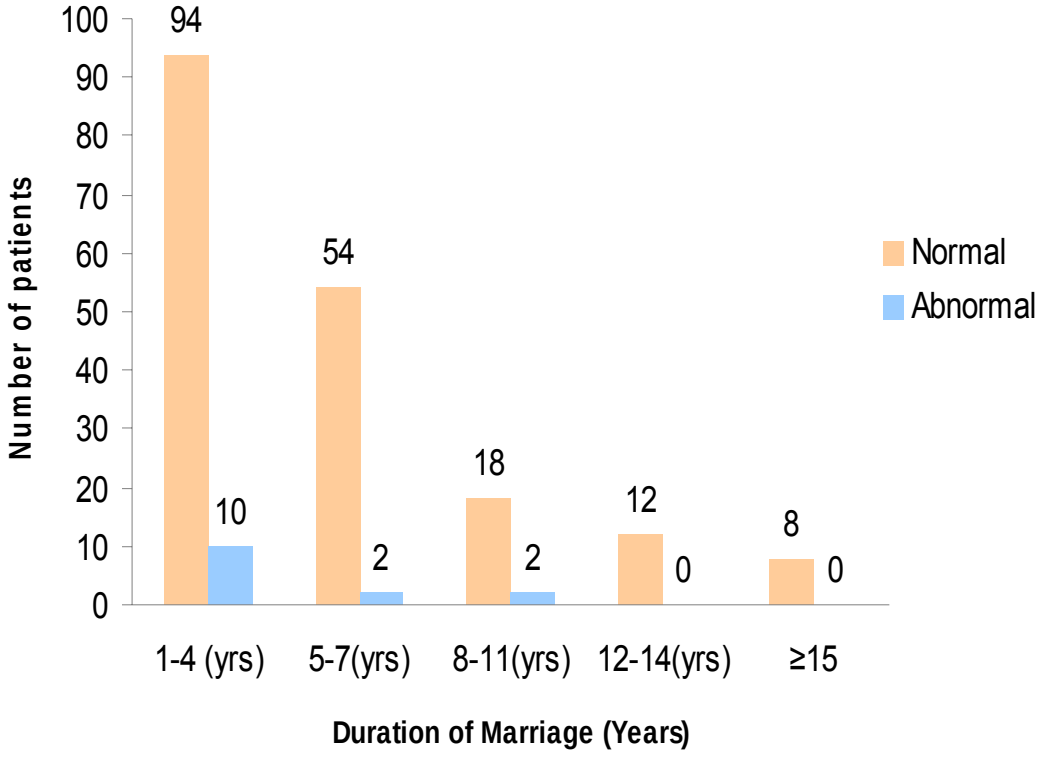
Duration	Normal	Abnormal	Total
1-4 (yrs)	94(50.5%)	10(71.4%)	104
5-7(yrs)	54(29%)	2(14.3%)	56
8-11(yrs)	18(9.7%)	2(14.3%)	20
12-14	12(6.5%)	0(0%)	12
≥15	8(4.3%)	0(0%)	8
Total	186	14	200

Chi Square = 3.886
Degree of freedom = 4
P-value = 0.4217
The association is insignificant

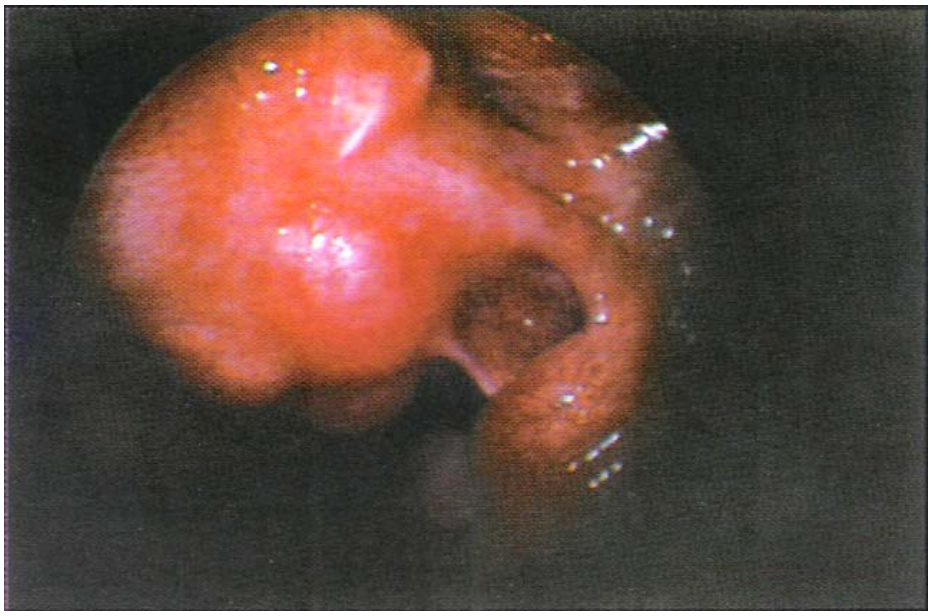
AGE WISE ANALYSIS OF UTERINE FACTORS
Figure - 13



ANALYSIS OF UTERINE FACTORS WITH RESPECT TO DURATION OF MARRIAGE
Figure - 14



LAPAROSCOPY – MULTIPLE FIBROIDS- UTERUS



LAPAROSCOPY – SEEDLING FIBROIDS - UTERUS

Table - 22

Endometriosis as a Cause of Infertility in Different Series

Name	Year	Percentage
Katayama	1989	25%
Rowland	1990	0
Peppeuela	1993	10-15%
Kandang Kerbau hospital	1996-1999	8-15%
Lister	2002	5%
Present study	**2007-2009**	**1.5%**

The cause of endometriosis was low – 3 patients (1.5%) in the present series where as it was around 10-15% in the other studies. This disparity may be due to the difference in the socio economic status of the patients taken in to the various studies.

VII. STUDY OF POUCH OF DOUGLAS

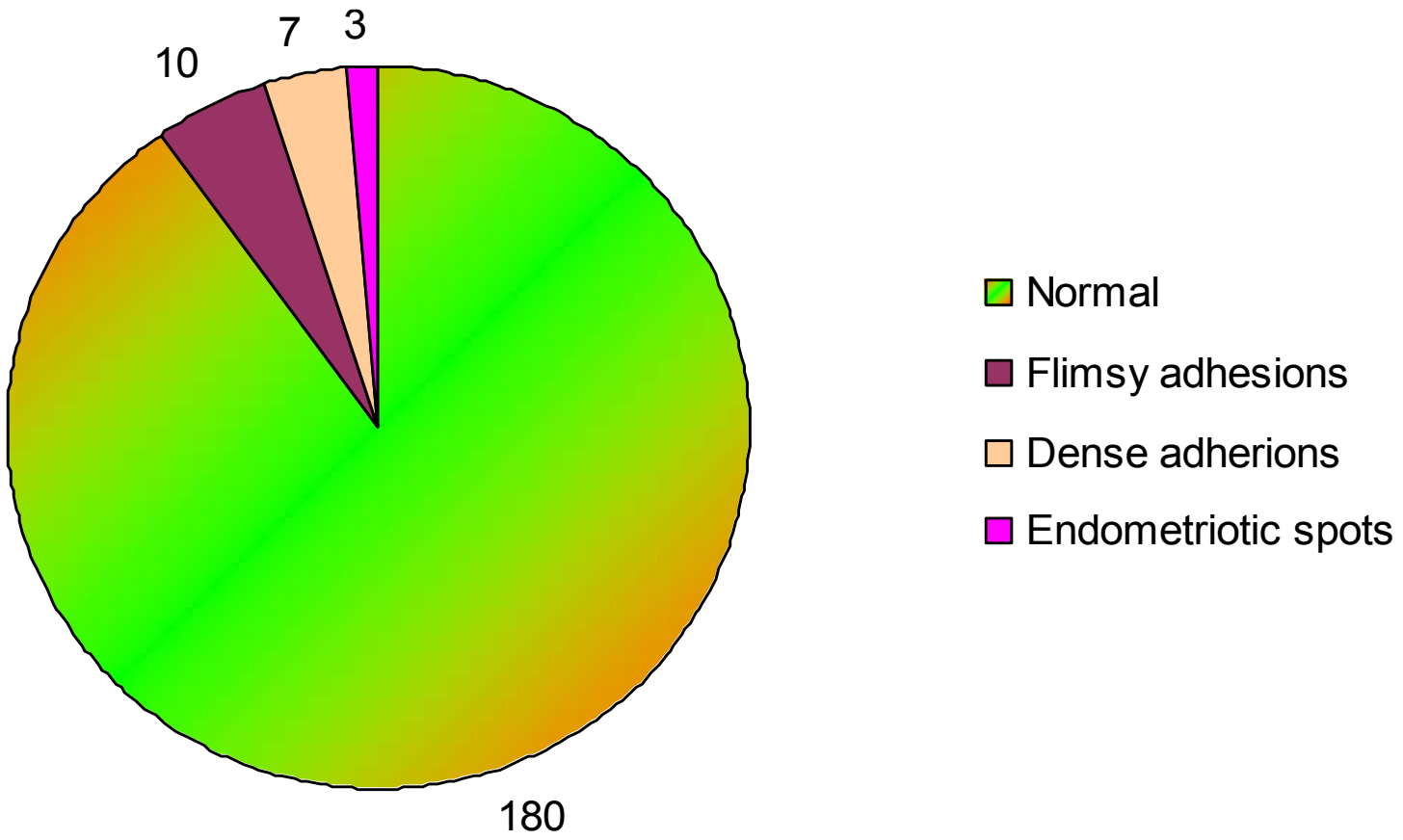
Table - 23

Study of Pouch of Douglas

Classification	Number	Percentage
Normal	180	90%
Flimsy adhesions	10	5%
Dense adhesions	7	3.5%
Endometriotic spots	3	1.5%

3 patients had small endometriotic spots over the ovaries uterosacral ligament & uterovesical fold with flimsy adhesions in the pouch of Douglas. They were treated with Gosrelin (GnRh analogue) -3.6mg subcutaneous every month for 3 months & followed up. 4 patients underwent laparoscopic adhesiolysis.

STUDY OF POUCH OF DOUGLAS
Figure - 15



LAPAROSCOPY – ENDOMETRIOSIS

VIII. HYSTEROSCOPIC FINDINGS

Table - 24

Hysteroscopic Findings in 6 Series of Infertile Patients

Classification	Cohen and Dimoniski 1987	Mohr & Lindemann 1990	Valle 1994	Taylor et.al., 2002	Harron & Salet Barow 2005	Present series 2007-2009
No. of. cases	34	167	142	701	128	200
Failed /cervical stenosis	2	0	0	24	0	6
Polyps / Endometrial Hyperplasia	2	0	34	89	6	1
Adhesions	4	19	28	155	27	1
Submucus Fibroids	2	11	0	5	4	6
Congenital anomalies	4	5	6	4	6	1(septate uterus)

In 6 patients (3%) hysteroscopic examination could not be completed because of cervical stenosis. In 194 women in whom hysteroscopy was performed, Submucus fibroid was noted in 6 patients, Endometrial polyp was noted in 1 patient and it was removed Hysteroscopically. Intrauterine adhesions was noted in 1 patient and Hysteroscopic adhesiolysis was done. There was 1 patient with septate uterus and septal resection was done.

Table -25

AGE WISE ANALYSIS OF HYSTEROSCOPIC FACTORS

Age	Normal	Abnormal	Total
20-25	56(30.1%)	4(28.6%)	60
26-30	98(52.7%)	8(57.1%)	106
31-35	32(17.2%)	2(14.3%)	34
Total	186	14	200

Chi Square = 01242
Degress of Freedom = 2
P-value = 0.9398

The association is insignificant

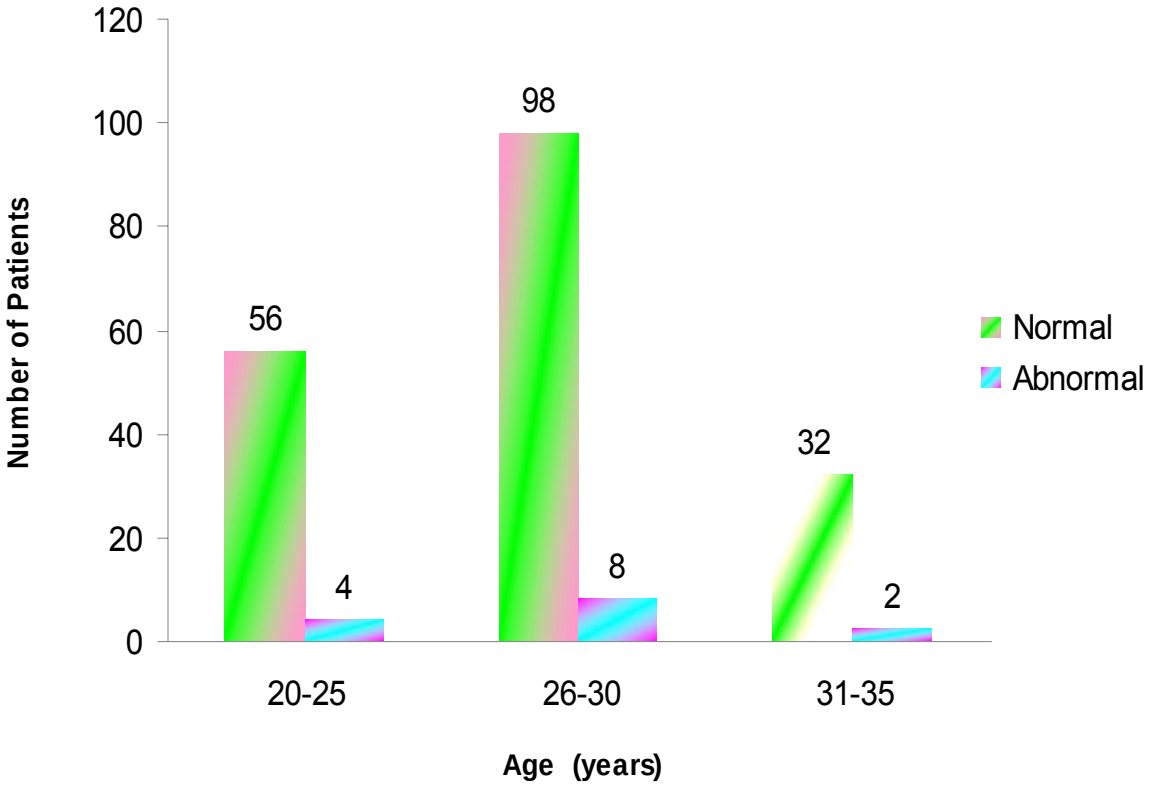
Table -26

ANALYSIS OF HYSTEROSCOPIC FACTORS WITH RESPECT TO DURATION OF MARRIAGE

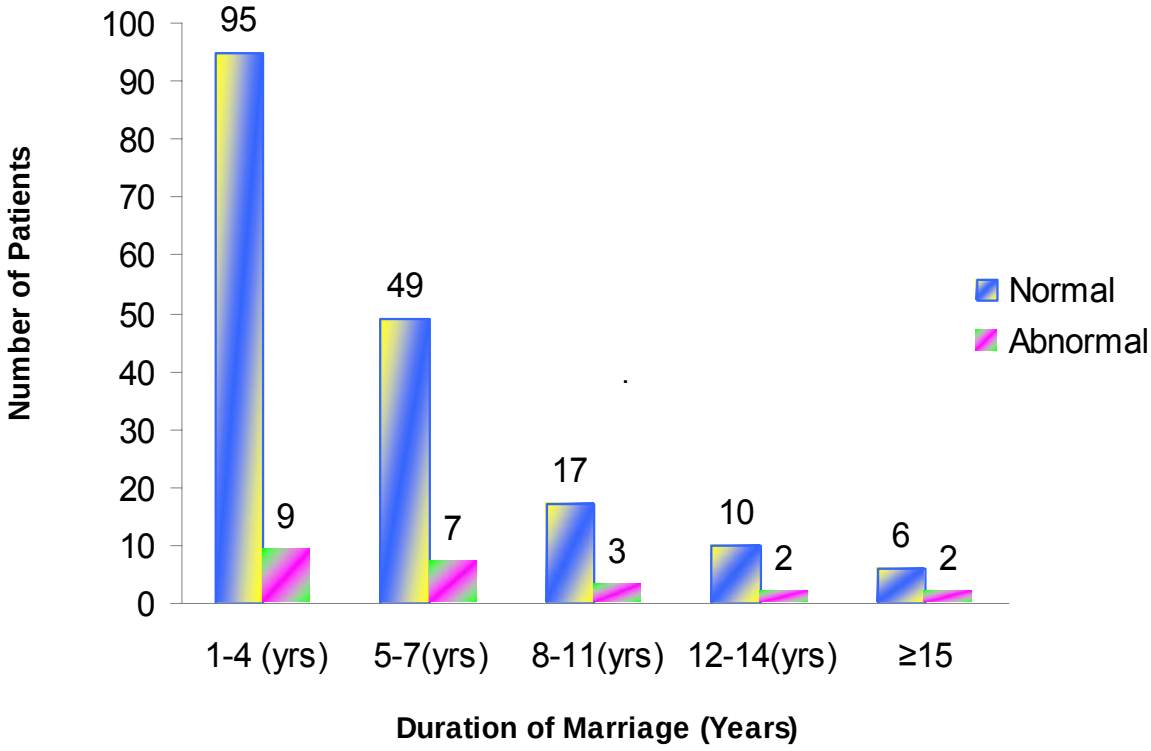
Duration	Normal	Abnormal	Total
1-4 (yrs)	95(53.7%)	9(49.1)	104
5-7(yrs)	49(27.7%)	7(30.4)	56
8-11(yrs)	17(9.6%)	3(13%)	20
12-14	10(5.6%)	2(8.7%)	12
≥15	6(3.4%)	2(8.7%)	8
Total	177	23	200

P-value = 0.6943
Chi Square = 2.871
Degree of freedom = 4
The association is insignificant

AGE WISE ANALYSIS OF HYSTEROSCOPIC FACTORS
Figure - 16

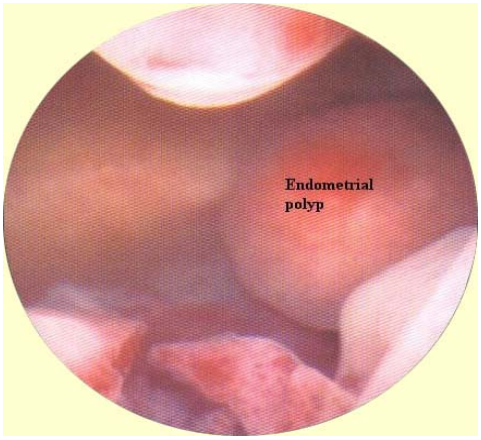


ANALYSIS OF HYSTEROSCOPIC FACTORS WITH RESPECT TO DURATION OF MARRIAGE
Figure - 17

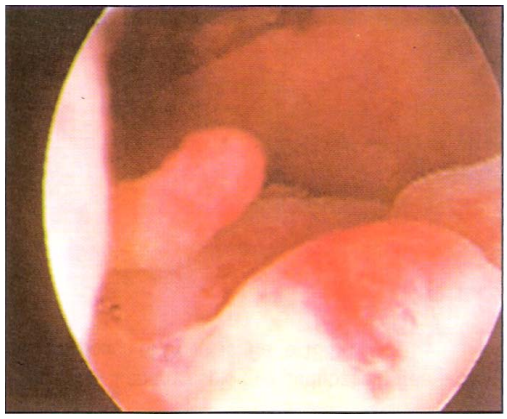


HYSTEROSCOPY

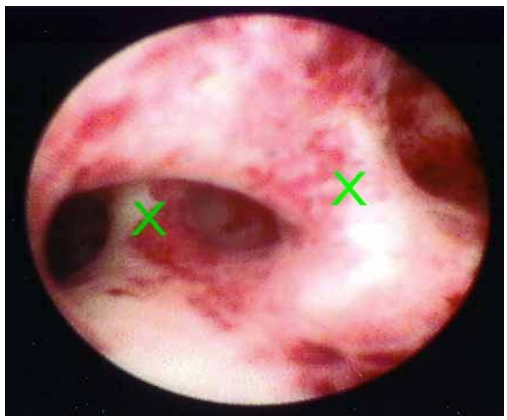
ENDOMETRIAL POLYP



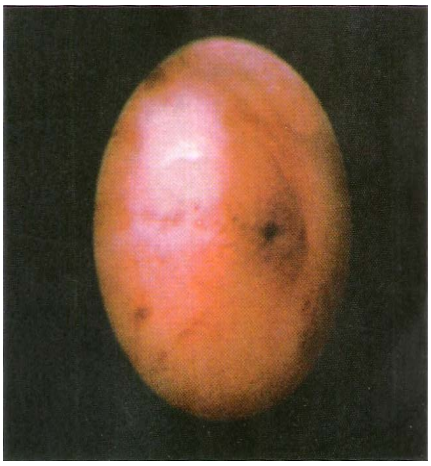
ENDOMETRIAL HYPERPLASIA

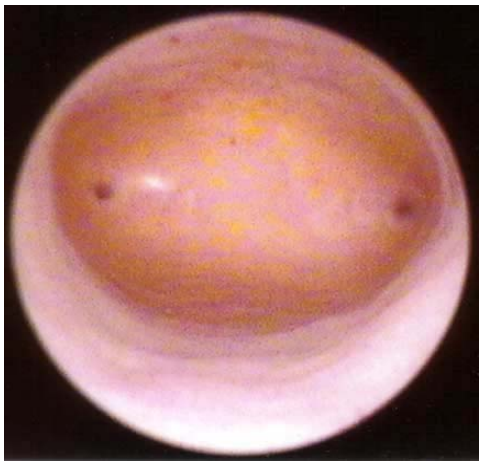


SUBMUCOUS FIBROID



INTRA UTERINE ADHESIONS





TUBAL OSTIA

Hysteroscopy offers safe, direct and accurate diagnosis of intrauterine lesions with low failure rate and decreased complication rates. Hysteroscopy allows diagnosis of small abnormalities not evident on hysterosalphingogram and also artifacts of hysterosalphingogram are avoided when hysteroscopy is used. It provides the opportunity not only to visualize the abnormalities but also to correct them in many cases.

By Laparoscopy, the external morphology of uterus with appendages and whole pelvic cavity could be visualized and abnormalities detected and some of them were corrected. Tubal patency can be tested by chromopertubation.

Hence when both Hysteroscopy and laparoscopy are combined, both the intrauterine pathology and abnormalities of the external morphology of uterus and appendages and whole pelvic cavity can be detected in the same sitting.

FOLLOW – UP

200 patients of primary infertility were evaluated in this study. 156 patients were followed up till the end of the study. 44 patients were lost follow up 52 patients in this series became pregnant counting to an incidence of 26%. This includes

1. 29 patients without any abnormalities.
2. 20 patients who had polycystic ovaries and was put on ovulation induction.
3. 3 patients who underwent laparoscopic adhesiolysis.

21 patients delivered via caesarean section. 6 patients delivered vaginally and the number of on going pregnancies is 22.Three patients underwent spontaneous abortion at 6-8 weeks of gestation.

SUMMARY AND CONCLUSION

SUMMARY AND CONCLUSION

This prospective study evaluated 200 patients of primary infertility by diagnostic hysterolaparoscopy, following the inclusion & exclusion criteria at Government Kilpauk Medical College Hospital, Chennai.

Complete information on the status of patients' reproductive tract is obtained. Both intrauterine and pelvic pathology could be detected at the same sitting. It minimises hospital stay and decreases cost and also the surgical and anasthetic risks to the patients.

In this prospective study of 200 patients of primary infertility diagnostic Hysterolaparoscopy was found to be extremely useful.

1. Presence of peritoneal factors, tubal factors and endometrial factors were diagnosed in the same sitting thereby improving the efficacy of infertility evaluation.
2. It avoids unnecessary radiological evaluation in a majority of cases.
3. It decreases hospital stay and decreases cost and inconveniences to the patients.
4. Patient is not exposed to anasthesia too often, as Hysteroscopy and Laparoscopy were combined in a single sitting.
5. It also decreases the time required to complete the initial infertility work up.

6. Among the infertile females attending KMCH, about 37.5% were found to have abnormalities in Diagnostic Hysterolaparoscopy.
7. The major abnormality was found to be in the ovaries.(58%)
8. The next major pathology was in the fallopian tubes as bilateral tubal block (16%)
9. The other fractions of pathology (26%) were variably dispersed among the uterine fibroids, peritoneal adhesions, intrauterine adhesions and endometriosis.
10. Majority of the patients diagnosed to have abnormalities were treated accordingly by medical (or) surgical management

Hence Diagnostic Hysterolaparoscopy is a safe, time- saving and effective tool in the panoramic evaluation of the infertile female.

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PROFORMA

PROFORMA

- ❖ Name :
- ❖ Age :
- ❖ Occupation :
- ❖ Address :
- ❖ IP.No. :
- ❖ Unit :
- ❖ Married : – years
- ❖ Consanguinity : Yes / No
- ❖ Duration of infertility :
- ❖ Age of menarche :
- ❖ Menstrual history : Cycle
  Duration of flow
  Amount
  Pain

- ❖ Previous examination and treatment for infertility – Yes / No If yes, specify:
- ❖ Any contraception used - Yes / No If yes, specify
- ❖ Any H/o PID /STD /TB/ surgery /drugs
- ❖ Dyspareunia : Absent /superficial /Deep

- Family History of TB/ DM/ HT : Yes / No
- General Examination : Normal /Abnormal
- Breasts – Tanner 1-5

  Discharge- Yes / No
- External genitalita – Normal \ Abnormal
- Speculum examination:
- Bimanual pelvic Examination:

  1) Uterus - Normal / Enlarged / Atrophic / Absent

  Position – AV/RV

  2) Uterosacral ligaments – Not palpable / Thickened / Nodular / Tender

- Seminal analysis of Husband
- VDRL
- Blood sugar
- Chest clinic opinion
- Tests for tubal Patency :-
- **Diagnostic laproscopy**:-

  1.Uterus

  2.Fallopian Tubes - Right / Left

  Chromopertubation

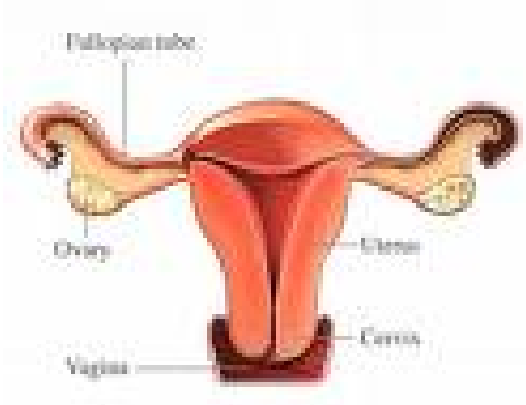
  3. Ovary

  4. Adhesions

5. Pouch of Douglas

6. Endometriosis

7.Tubercle



- **Hysteroscopy**

    1. External os
    2. Cervical canal
    3. Internal os
    4. Uterine cavity
        1. Ostia
        2. Endometrium
        3. Adhesions

- Treatment
- Follow up

MASTER CHART

MASTER CHART

Sl.No	Name	Age	MD	Menst Cycles	uterus	ovaries		Tubes				ADH/Em	POD	Hysterscopy	Endometrial biopsy
						Right	left	Right	Left	R	L				
										Spill					
								Right	Left	R	L				
1	Jayalakshmi	36	4	4-35	N	N	N	N	N	+	+	-	N	N	S
2	sathya	29	2	3-35	N	N	N	N	N	+	+	-	N	N	S
3	Sijima	24	3	3-35	N	N	abs	N	abs	+	-	-	N	N	NO
4	Jayalakshmi	27	2	4-30	N	N	N	N	N	+	+	-	N	N	S
5	Ramitha	25	1	3-30	N	N	N	N	N	+	+	-	N	N	S
6	Amudha	25	1	4-30	N	Pco	N	N	N	+	+	DA	DA	CS	P
7	srideri	27	2	5-35	N	N	N	N	N	-	-	-	N	N	S
8	Kanchana	33	4	3-35	N	N	N	N	N	-	-	-	N	N	P
9	srideri	29	3	3-30	N	N	N	N	N	+	+	-	N	N	S
10	Tamilarasi	35	7	3-35	N	N	N	N	N	+	-	-	N	N	S
11	Tharamani	22	2	3-40	Seedling fibroidant 1x1wall	N	N	N	N	+	+	-	N	N	NO
12	Arul	30	3	3-45	N	N	N	N	N	+	+	-	N	N	P

13	Maheswari	32	6	3-40	N	Pco	N	N	N	+	+	-	N	N	S
14	Kalpana	23	5	3-35	N	N	N	N	N	+	+	-	N	N	P
15	selvi	27	2	4-30	N	N	N	N	N	+	+	-	N	N	S
16	Jansy Rani	20	1	3-35	N	N	N	N	Hydro salph	-	-	-	N	N	S
17	samhamary	28	5	2-30	Seedlingfibroidan t 2x1cm	N	N	N	N	+	+	-	N	N	S
18	Manjula	24	2	3-35	N	N	PCO	N	N	-	+	-	N	N	NO
19	Bavani	26	2	4-29	N	N	N	N	Hydro salph	+	-	-	N	N	S
20	Yogeswari	29	6	3-28	N	N	N	N	N	+	+		N	N	P
21	Nadhiya	27	1	3-30	N	N	N	N	N	+	+	-	N	N	P
22	Indra	26	5	4-28	N	N	N	FC 1x1 cm	N	+	+	-	N	N	P
23	shakial	21	1	5-30	N	N	N	N	N	+	+	-	N	N	S
24	Sumathy	29	8	4-35	N	N	N	N	N	+	+	-	N	N	P
25	Premalakshmi	32	10	3-30	N	N	N	N	N	+	+	-	N	N	S
26	Sacikala	28	2	3-35	N	N	N	N	N	+	+	-	N	N	S
27	Lalitha	26	6	2-28	N	N	N	N	N	+	+	-	N	N	S
28	Maheswari	23	2	3-30	N	N	PCO	Hydro salph	Hydro salph	-	-	FA	FA	N	P
29	Tamilselvi	27	5	7-40	N	N	N	N	N	+	+	-	N	N	S
30	Vaishani	33	12	6-35	N	N	N	N	N	+	+	-	N	N	S
31	selvi	24	3	7-21	Two seedling fibroids 2x2 cm	N	N	N	N	+	+	-	N	N	S
32	Govindemmal	28	8	7-30	N	N	N	N	N	+	+	-	N	N	NO

33	Pandiyarani	29	11	5-35	N	Pco	PCO	N	N	+	+	-	N	N	S
34	Shanthi	22	1	3-35	N	N	N	N	N	+	+	-	N	polyp 2X2 cm	P
35	kasthuri	35	13	3-35	N	N	N	Hydro salph	N	+	+	-	N	N	S
36	suseela	21	1	3-30	N	N	N	N	N	+	+	-	N	N	S
37	Rani	30	9	4-30	N	N	N	Hydro salph	N	+	+	-	N	N	NO
38	Vijay	26	6	5-28	N	PCO	PCO	N	N	+	+	-	N	N	S
39	Meena	24	2	7-30	N	N	N	N	N	+	+	-	N	N	P
40	Ratha	27	5	6-35	N	N	N	FC 1x1 cm	N	+	+	-	N	N	P
41	Latha	28	5	5-36	N	N	N	N	N	+	+	-	N	N	NO
42	Banu	29	3	4-35	N	N	N	N	N	+	+	-	N	N	S
43	Kalaivani	22	2	5-45	N	N	N	N	N	+	+	-	N	N	S
44	Bowsia	27	1	6-40	Fibroid 5x6cm	N	N	N	N	-	+	-	N	N	S
45	Banathi	33	6	7-35	N	N	N	N	N	+	+	-	N	N	NO
46	Nalini	26	2	6-33	N	Em	N	N	N	+	+	-	N	N	P
47	Natchathiram	34	4	4-33	N	N	N	N	N	+	+	-	N	N	P
48	Sanaswathy	21	1	5-35	N	N	N	LC	LC	+	+	-	N	N	P
49	Amusuya	28	2	6-30	N	N	PCO	N	N	+	+	-	N	N	P
50	Sumalahta	29	7	5-35	N	N	N	N	N	+	+	-	N	N	NO
51	Hemamalini	35	7	4-35	N	N	N	N	N	+	+	-	N	N	S
52	paravathy	30	3	5-35	N	N	N	N	N	+	+	-	N	ADH	S

53	umamaherwari	20	4	4-30	N	N	N	N	N	+	+	-	N	N	S
54	Panchavarnam	26	5	5-30	N	N	PCO	N	N	+	+	-	N	N	P
55	usha	27	1	4-30	Seedling fibroid2x1cm	Pco	N	N	N	+	+	-	N	CS	S
56	Sarikala	24	2	5-30	N	N	N	Hydro salph	N	+	+	-	N	N	S
57	Subashini	28	3	4-60	N	N	N	N	N	+	+	-	N	N	NO
58	kanchanan	25	4	4-30	N	Pco	PCO	N	N	-	-	FA	FA	N	SH
59	Nalini	29	2	5-30	N	N	N	N	N	+	+	-	N	N	s
60	Subha	30	3	3-35	N	N	N	N	N	-	-	-	N	N	s
61	Sarithri	26	4	3-30	N	N	PCO	N	N	+	+	-	N	Fibroid 1x2cm	p
62	Shameem	27	1	5-40	N	Pco	PCO	N	N	+	+	-	N	N	S
63	chitra	22	2	5-30	N	N	N	N	N	+	+	-	N	N	S
64	Meenatehi	28	6	5-35	N	Pco	N	N	N	+	+	-	N	N	P
65	Gomathy	34	9	5-35	N	N	N	N	N	+	+	-	N	N	S
66	Deepa	21	1	6-32	N	Ovarian cyst 6x7cm	N	N	N	+	+	-	N	N	S
67	Gowri	29	5	4-35	N	N	N	N	Adh	+	+	EM	EM	N	S
68	Erangshanthi	23	2	5-30	N	N	N	N	N	+	+	-	N	N	S
69	Hemalatha	30	8	5-25	N	N	N	N	N	+	+	-	N	N	P
70	Visalakshi	32	6	5-22	Seedling fibroid2x1cm	N	N	N	N	+	+	-	N	N	SH
71	Kanniammal	24	3	3-21	N	N	N	N	N	+	+	-	N	N	S
72	Vimala	26	1	5-28	N	N	N	N	N	+	+	-	N	N	S

73	Manjula	27	5	5-29	N	Pco	PCO	N	N	+	+	-	N	N	S
74	selvi	25	2	3-30	N	N	N	N	N	+	+	-	N	N	TB
75	Ramalakshmi	33	12	3-45	N	N	N	N	N	+	+	-	N	N	S
76	Pown	28	9	3-30	N	N	N	LC	LC	+	+	-	N	N	NO
77	chitra	22	3	2-29	N	N	N	N	N	+	+	-	N	N	S
78	Varuki	29	10	5-40	Seedling fibroid 2x1cm	Pco	PCO	N	N	+	+	FA	FA	N	S
79	Kavitha	23	1	3-35	N	N	PCO	N	N	+	+	-	N	N	P
80	Devi	30	14	3-35	N	N	abs	N	abs	+	-	-	N	N	S
81	Anitha	26	2	3-30	N	N	N	N	N	+	-	-	N	CS	NO
82	Rajewari	27	7	5-30	N	N	PCO	N	N	+	+	-	N	N	P
83	Snlochna	22	2	5-30	N	N	N	N	N	+	+	-	N	N	NO
84	mahalxmi	26	3	3-35	N	N	N	Adh		+	+	-	N	N	P
85	Anjelina	31	10	4-35	N	N	N	N	N	-	+	-	N	N	P
86	Maheswari	27	6	3-30	N	N	N	N	N	+	+	-	N	N	P
87	megala	25	7	4-35	Seeding fibroid 2x1cm	N	N	N	N	+	+	-	N	N	S
88	selvi	22	1	5-30	N	N	N	N	N	+	+	-	N	N	S
89	Tamilselvi	28	8	5-35	N	N	N	N	Hydro salph	+	+	-	N	N	S
90	Karpagarathi	29	5	4-30	N	N	N	N	N	+	+	-	N	Fibroid 1x2cm	S
91	Bavathi	24	2	5-36	N	N	PCO	N	N	+	+	-	N	N	NO
92	Hlamla	34	4	5-35	L	PCO	N	N	N	+	+	-	N	N	P

93	Kalaiselvi	34	16	4-30	N	N	N	N	N	+	+	-	N	CS	S
94	Devi	30	2	5-35	Fibroid 5x6cm	N	N	N	N	-	-	-	N	N	S
95	Jaya	27	5	4-35	N	N	N	LC	LC	+	+	-	N	N	S
96	Vijaya	20	3	3-30	N	N	N	N	N	+	+	-	N	N	S
97	Akila	20	1	2-35	N	PCO	PCO	N	N	+	+	-	N	N	P
98	Lakshmi	23	2	2-35	N	N	N	N	N	+	+	-	N	CS	S
99	Kanpagam	33	15	2-30	N	N	N	N	N	+	+	-	N	N	P
100	Valarmathi	26	6	2-28	N	N	N	N	N	-	-	DA	DA	N	S
101	Vena	30	8	2-30	N	N	N	N	N	+	+	-	N	N	S
102	Shanthi	29	9	3-34	Seedling fibroid 1x1cm	PCO	PCO	N	N	+	+	FA	FA	N	P
103	Usha	28	5	3-30	N	N	N	N	N	+	+	-	N	N	S
104	Barathy	27	2	3-35	N	N	N	N	N	-	-	-	N	Fibroid 1x2cm	NO
105	Vijaya	26	2	3-30	N	Pco	PCO	N	N	+	+	-	N	N	P
106	Hema	27	5	3-33	N	N	N	N	N	+	+	-	N	N	S
107	Mariyathai	20	1	3-35	N	N	N	N	ADH	+	+	-	N	N	S
108	Nathiya	29	3	3-34	Seedling fibroid2x1cm	Pco	N	N	N	+	+	EM	EM	N	S
109	Devikala	22	1	5-35	N	Pco	PCO	N	N	+	+	-	N	N	S
110	Vijayalakshmi	30	6	4-33	N	N	N	N	N	+	+	-	N	N	P
111	sheeladevi	34	3	5-33	N	N	N	N	N	+	+	-	N	N	S
112	selvi	26	4	4-32	N	N	N	N	N	-	+	-	N	N	SH

113	vakitha	22	1	4-30	N	N	N	N	N	+	+	-	N	N	TB
114	Baby	27	7	3-40	N	N	Ovarian cyst	N	N	+	+	-	N	N	S
115	Sarikala	35	15	5-60	N	N	N	N	N	+	+	-	N	N	S
116	vasanthi	29	3	5-30	N	N	N	N	N	+	+	-	N	N	NO
117	Parimala	23	2	5-45	N	Pco	N	N	N	-	+	-	N	N	S
118	Jothy	30	7	5-35	N	N	N	N	N	+	+	FA	FA	N	S
119	Lakshmi	31	6	2-35	N	N	N	N	N	+	+	-	N	N	S
120	selvi	26	4	3-30	Three seedling fibroid 2x1cm	N	N	Hydro salph	Hydro salph	-	-	-	N	N	S
121	latha	28	5	3-35	N	N	N	N	N	+	+	-	N	N	SH
122	Kalaivani	23	2	3-30	N	N	N	N	N	+	+	-	N	N	S
123	Barani	29	4	3-35	N	N	N	N	N	+	+	-	N	N	S
124	Mahalakshmi	35	18	3-30	N	Pco	PCO	N	N	+	+	-	N	N	P
125	shanthi	35	3	3-40	N	N	N	N	N	+	+	-	N	Fibroid 1x2cm	P
126	Danalakshmi	30	1	3-45	N	N	N	N	N	-	-	-	N	N	P
127	Jeeva	31	5	3-35	N	PCO	N	N	N	+	+	-	N	N	p
128	Jeyakala	26	8	3-35	N	N	N	N	N	+	+	-	N	N	p
129	Daisy	20	1	3-30	N	N	N	N	N	+	+	-	N	N	P
130	Padmavathy	27	5	3-35	N	N	N	N	N	+	+	-	N	N	P
131	vanitha	35	15	2-60	Fibroid 8x9cm	N	N	N	N	+	+	-	DA	N	S
132	Regianmary	21	2	3-90	N	N	N	N	N	+	-	-	N	N	S

133	Anandhi	28	6	2-60	N	PCO	PCO	N	N	+	+	DA	N	N	P
134	mariammal	33	6	2-45	Seedling fibroid 2x1cm	PCO	PCO	N	N	+	+	-	N	N	P
135	Pavithra	29	11	3-60	N	N	N	N	N	+	+	-	N	Fibroid 1x1cm	S
136	Meenatehi	22	2	3-30	N	N	N	N	N	+	+	-	FA	N	SH
137	Kowsalya	30	7	2-28	N	N	N	N	N	+	+	-	N	N	S
138	chitra	27	6	2-29	N	N	N	N	N	+	+	-	N	N	S
139	Jeyanthi	28	12	2-35	Muitpleseedling fibroids	N	N	N	N	-	-	FA	FA	N	S
140	Prabavathy	23	2	2-35	N	N	N	N	ADH	+	+	-	N	N	S
141	Kamatehi	26	8	3-60		N	N	N	N	+	+	-	N	N	NO
142	Vijayalakshmi	27	9	3-90	N	PCO	PCO	Hydro salph	Hydro salph	-	+	DA	DA	N	P
143	shanthi	24	5	2-40	N	N	N	N	N	+	+	-	N	N	P
144	kavith	29	12	2-29	N	N	N	N	N	+	+	-	N	N	P
145	kasthuri	34	16	2-30	Seedling fibroid 2x1cm	N	N	N	N	+	+	-	N	N	P
146	Priya	28	10	2-30	N	N	N	N	N	+	+	-	N	N	NO
147	Mohana	26	7	2-60	N	PCO	PCO	N	N	+	+	-	N	N	P
148	Rasheedha	21	1	3-45	N	N	N	N	N	+	+	-	N	N	P
149	saraswathi	27	5	3-25	N	N	N	N	N	+	+	-	N	N	S
150	sheeba	33	7	3-26	N	PCO	PCO	N	N	+	+	-	N	N	P
151	Vijayalakshmi	28	6	2-30	N	N	N	N	N	+	+	-	N	N	S
152	Thrisal	23	2	3-32	Seedling fibroid 2x1cm	N	N	N	N	+	-	-	N	N	S

153	Menaka	29	3	2-29	N	N	N	N	NN	+	+	-	N	N	S
154	vasanthi	26	4	4-32	N	N	N	N	N	-	+	-	N	SU	S
155	Tamilselvi	30	7	5-36	N	N	N	N	N	+	+	-	N	N	S
156	chitra	22	2	4-33	N	N	N	N	Hydro salph	+	+	-	N	N	TB
157	malini	35	6	5-33	N	N	N	N	N	+	+	-	N	N	S
158	Bavani	27	5	5-30	N	TO mass	TO mass	N	N	-	+	DA	DA	N	S
159	Sarala	28	4	3-29	seedling fibroid 2x2cm	N	N	N	N	+	+	-	N	N	S
160	Datehayani	24	3	3-26	N	N	N	N	N	+	+	-	N	N	NO
161	Deepa	34	6	3-30	N	N	N	N	N	+	+	-	N	N	NO
162	Daisy	29	5	3-28	N	PCO	PCO	N	N	+	+	-	N	N	E
163	Kalaimagal	24	2	3-26	N	abs	N	abs	N	-	+	-	N	N	P
164	Bobila	33	7	5-28	N	N	N	N	N	-	+	-	N	N	S
165	Iavarasi	30	5	5-13	Seedling fibroid 2x1cm	N	N	N	N	+	+	-	N	N	S
166	Nirmala	26	3	5-33	N	PCO	N	N	N	+	-	-	N	N	S
167	Revathi	29	5	6-33	N	N	N	N	N	+	+	-	DA	N	P
168	Malathy	22	1	3-36	N	N	N	N	N	+	+	-	N	N	NO
169	Ishwaraya	28	8	3-32	N	N	N	N	N	+	+	-	N	N	S
170	Faridha	32	5	5-35	N	N	N	N	N	+	+	-	N	N	S
171	Kalaianasi	21	2	4-45	N	Em	Em	N	N	+	+	-	N	N	S
172	Gangadevi	29	7	3-40	N	N	N	N	N	+	+	-	N	N	S

173	Sngnma	30	12	4-45	N	N	N	N	N	+	+	-	N	N	S
174	Manju	20	3	3-40	N	N	N	Lc	Lc	-	+	-	N	Fibroid 2x1cm	S
175	Barathi	31	6	3-30	N	N	PCO	N	N	+	+	-	N	N	S
176	Harini	27	9	3-40	N	N	N	N	N	+	+	-	N	N	P
177	Kavitha	20	2	3-30	N	N	N	N	N	+	+	-	N	N	S
178	Parrathy	33	6	3-35	N	TO mass	TO mass	Hydro salph	Hydro salph	+	-	-	N	N	P
179	Anuja	26	6	3-90	N	N	N	N	N	+	+	-	N	N	S
180	veni	20	1	3-30	N	N	N	N	N	+	+	-	N	N	NO
181	Annie	28	11	3-40	Seedling fibroid 2x1cm	TO mass	TO mass	N	N	+	+	DA	DA	N	S
182	Arthy	24	2	3-35	N	N	N	N	N	+	+	-	N	N	S
183	Asma	29	11	3-35	N	N	N	N	N	+	+	-	N	N	NO
184	Chandra	30	10	3-30	N	N	PCO	N	N	-	+	-	N	N	S
185	suma	29	5	5-34	N	PCO	PCO	N	N	+	+	-	N	N	S
186	Keerthi	27	7	6-35	N	N	N	N	N	+	-	-	N	N	NO
187	Meena	28	9	5-35	N	PCO	N	N	N	+	+	-	N	N	P
188	Archana	20	1	6-33	N	PCO	PCO	N	N	+	+	-	N	N	P
189	Ratha	26	5	5-90	N	N	N	N	N	+	+	-	N	N	S
190	Poovitha	32	11	5-40	N	N	N	N	N	-	+	-	N	N	NO
191	poorani	22	1	5-35	N	N	N	Hydro salph	N	+	+	-	N	N	S
192	Devaki	34	17	3-30	N	N	N	N	N	+	+	EM	N	N	SH

193	Rani	27	7	3-35	N	N	N	N	N	+	+	-	N	N	S
194	Poornima	22	2	3-30	N	N	N	N	N	+	+	-	N	N	S
195	Barathi	33	15	4-40	N	PCO	PCO	N	N	+	+		N	N	SH
196	Annamal	24	2	3-60	N	N	N	N	N	+	-	-	N	N	TB
197	Ilayanila	28	6	4-35	N	N	N	ADH	N	+	+	-	N	N	S
198	yuvarani	24	2	5-30	N	N	N	N	N	+	+	FA	FA	N	S
199	Aruarasi	25	3	5-30	N	N	N	N	N	+	-	-	N	N	NO
200	Banu	26	2	5-30	N	N	N	N	N	+	-	-	N	N	S

MD- Duration of Marriage

ADH- Adhesions

EM- Endometriosis

POD- Pouch of Douglas

N- Normal

P-Proliferative Endometrium

S-Secretory Endometrium

SH-Simple hyperplasia

NO- No endometrium

CS- Cervical stenosis

FA- Flimsy adhesions

DA- Dense adhesions

PCO- Polycystic ovary

LC - long and convoluted fallopian tubes
SU-septate uterus